



Maintenance Manual

RANSOMES Parkway 2250 Plus

Series: WB - Engine type: Kubota V1505

Product code: LGNN040

Series: CT - Engine type: Ford VSG413

Product code: LGNN100

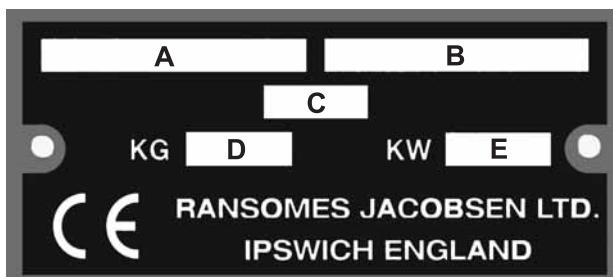


WARNING: If incorrectly used this machine can cause severe injury. Those who use and maintain this machine should be trained in its proper use, warned of its dangers and should read the entire manual before attempting to set up, operate, adjust or service the machine.



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2.1 PRODUCT IDENTIFICATION



- A Machine Name
- B Serial Number
- C Year of Manufacture
- D Machine Weight
- E Engine Power

2.2 Spares Stocking Guide

To keep your equipment fully operational and productive, Ransomes suggests you maintain a stock of the more commonly used maintenance items. We have included part numbers for the additional support materials and training aids.

Service Parts			
Part No	Description	Part No.	Description
008196060	Engine Oil Filter - Diesel	13351-43011	Inline Fuel Filter - Diesel
1070523	Engine Oil Filter - LPG	178078	Engine Fuel Filter - Diesel
008089620	Hydraulic Filter	1120825	Spark Plug - LPG
2198147-01	Air Cleaner Element	N203438	Fan Belt - LPG
0082971910	Ignition Switch		

Service Support Material			
Part No	Description	Part No.	Description
97898-03340	Kubota Engine Parts Manual	194265	Ford Engine Parts Manual
16622-8916-2	Kubota Engine Operators Manual	DSL58221	Ford LPG Engine Operators Manual
97897-00880	Kubota Engine Service Manual	24564G	Ford Engine Service Manual

2.3 HOW TO USE THE PARTS MANUAL**ITEMNUMBER**

Each part which is identified in the illustrations has an item number. Parts which do not have an item number may not be readily identified in the illustration but are usually closely associated with the immediately adjacent part.

ASSEMBLIES

A complete assembly, e.g. a wheel motor or hydraulic motor or roll assembly, is listed as a complete item with subsequent individual components listed separately.

The assembly is listed under its part number with component parts being listed offset to the right, e.g.:-

ITEM	RANSOMES PART NO.	DESCRIPTION	QTY	REMARKS
1	LMSD798	Roll Assy.	1	ALL MACHINES
2	MBB4490	• Tube	1	
3	LMSD926	• End Cap Assy.	2	
4	MBB6851	• • End Cap	1	
5	H009116	• • Bearing	1	
6	MBB2356	• Seal Housing	1	
7	A224016	• Seal	2	
*	A122192	Screw	2	

It may not be possible to illustrate every item. With certain items purchased from outside suppliers some component parts may not be available from Ransomes and may need to be specially ordered from the supplier e.g. Volvo hydraulic motor components.

QUANTITIES

Quantities shown are for one assembly or sub-assembly.

USING THE PARTS LIST

Determine the function and application of the part required. Turn to the main index page and select the appropriate section. Locate the part on the illustration and parts list and read off the quantity from the appropriate MODEL column.

NUMERICAL INDEX

This is a summary of all part numbers used in the manual arranged in numerical sequence and showing the page and item number under which the parts appear.

ORDERING OF SPARE PARTS

When ordering replacement parts, it is most important to quote the SERIAL NUMBER of the machine, PART NUMBER, DESCRIPTION and QUANTITY required.

Any arbitrary modifications carried out on this machine may relieve the manufacturer of liability for any resulting damage or injury.

ABBREVIATIONS

N/A Not Available

AR As Required



This safety symbol indicates important safety messages in this manual. When you see this symbol, be alert to the possibility of injury, carefully read the message that follows, and inform other operators.

3.1 OPERATING INSTRUCTIONS

- Ensure that the instructions in this book are read and fully understood.
- No person should be allowed to operate this machine unless they are fully acquainted with all the controls and the safety procedures.
- Never allow children or people unfamiliar with these instructions to use this machine. Local regulations may restrict the age of the operator.

3.2 SAFETY SIGNS

- It is essential all safety labels are kept legible, if they are missing or illegible they must be replaced. If any part of the machine is replaced and it originally carried a safety label, a new label must be affixed to the replacement part. New safety labels are obtainable from Ransomes dealers.

3.3 STARTING THE ENGINE

- Before starting the engine check that the brakes are applied, drives are in neutral, guards are in position and intact, and bystanders are clear of the machine.
- Do not run the engine in a building without adequate ventilation.

3.4 DRIVING THE MACHINE

- Before moving the machine, check to ensure that all parts are in good working order, paying particular attention to brakes, tyres, steering and the security of cutting blades.
- Replace faulty silencers, mow only in daylight or good artificial light
- Always observe the Highway Code both on and off the roads. Keep alert and aware at all times. Watch out for traffic when crossing or near roadways.
- Stop the blades rotating before crossing surfaces other than grass.

- Remember that some people are deaf or blind and that children and animals can be unpredictable.
- Keep travelling speeds low enough for an emergency stop to be effective and safe at all times, in any conditions.
- Remove or avoid obstructions in the area to be cut, thus reducing the possibility of injury to yourself and/or bystanders.
- When reversing, take special care to ensure that the area behind is clear of obstructions and/or bystanders. DO NOT carry passengers.
- Keep in mind that the operator or user is responsible for accidents or hazards occurring to other people or their property.
- When the machine is to be parked, stored or left unattended, lower the cutting means unless the transport locks are being used.
- While mowing, always wear substantial footwear and long trousers. Do not operate the equipment when barefoot or wearing open sandals.
- Check the grass catcher frequently for wear or deterioration. After striking a foreign object. Inspect the lawnmower for damage and make repairs before restarting and operating the equipment.
- If the machine starts to vibrate abnormally, check immediately.

3.5 TRANSPORTING

- Ensure that the cutting units are securely fastened in the transport position. Do not transport with cutting mechanism rotating.
- Drive the machine with due consideration of road and surface conditions, inclines and local undulations.
- Sudden decelerating or braking can cause the rear wheels to lift.
- Remember that the stability of the rear of the machine is reduced as the fuel is used.

3.6 LEAVING THE DRIVING POSITION

- Park the machine on level ground.
- Before leaving the driving position, stop the engine and make sure all moving parts are stationary. Apply brakes and disengage all drives. Remove the starter key.

3.7 SLOPES

TAKE EXTRA CARE WHEN WORKING ON SLOPES

- Local undulations and sinkage will change the general slope. Avoid ground conditions which can cause the machine to slide.
- Keep machine speeds low on slopes and during tight turns.
- Sudden decelerating or braking can cause the rear wheels to lift. Remember there is no such thing as a "safe" slope.
- Travel on grass slopes requires particular care.

DO NOT USE ON SLOPES GREATER THAN 15°

IMPORTANT: When working on any slope set the weight transfer, if fitted to its maximum (+) setting.

3.8 BLOCKED CUTTING CYLINDERS

- Stop the engine and make sure all moving parts are stationary.
- Apply brakes and disengage all drives.
- Release blockages with care. Keep all parts of the body away from the cutting edge. Beware of energy in the drive which can cause rotation when the blockage is released.
- Keep other people away from the cutting units as rotation of one cylinder can cause the others to rotate.

3.9 ADJUSTMENTS, LUBRICATION AND MAINTENANCE**All vehicles**

- Stop the engine and make sure all moving parts are stationary.
- Apply brakes and disengage all drives.
- Read all the appropriate servicing instructions.
- Use only the replacement parts supplied by the original manufacturer.
- When adjusting the cutting cylinders take care not to get hands and feet trapped when rotating cylinders.
- Make sure that other people are not touching any cutting units, as rotation of one cylinder can cause the others to rotate.
- To reduce the fire hazard, keep the engine, silencer and battery compartments free of grass, leaves or excessive grease.
- Replace worn or damaged parts for safety.
- When working underneath lifted parts or machines, make sure adequate support is provided.
- Do not dismantle the machine without releasing or restraining forces which can cause parts to move suddenly.
- Do not alter engine speed above maximum quoted in Engine Specification. Do not

change the engine governor settings or overspeed the engine. Operating the engine at excessive speed may increase the hazard of personal injury.

- When servicing batteries, DO NOT SMOKE, and keep naked lights away.
- Do not place any metal objects across the terminals.

Diesel & Petrol vehicles

- When refuelling, STOP THE ENGINE, DO NOT SMOKE. Add fuel before starting the engine, never add fuel while the engine is running.
- Use a funnel when pouring fuel from a can into the tank.
- Do not fill the fuel tank beyond the bottom of the filler neck.
- Replace all fuel tank and container caps securely.
- Store fuel in containers specifically designed for this purpose.
- Refuel outdoors only and do not smoke while refuelling.
- If fuel is spilled, do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until fuel vapours have dissipated.
- Allow the engine to cool before storing in any enclosure.
- Never store the equipment with fuel in the tank inside a building where fumes may reach an open flame or spark.
- If the fuel tank has to be drained, this should be done outdoors.
- Do not spill fuel onto hot components.

LPG vehicles

- Only trained & competent personnel in the use of LPG as a road vehicle fuel are allowed to work on LPG aspects of the vehicles engine or fuel system.
- When refuelling, STOP THE ENGINE, DO NOT SMOKE. Add fuel before starting the engine, never add fuel while the engine is running.
- Vehicles should not be parked within 3 meters of any heat source, open flame or other sources of ignition.
- Vehicles should not be serviced over an inspection pit
- **If for any reason a leak in the fuel system is suspected, the vehicle should be moved to an isolated area clear of buildings & people and as far as possible from drains and any source of ignition.**

- The fuel filler bayonet on the vehicle should be inspected regularly for any signs of damage.
- The gas used to fill the vehicle must be sourced from a reputable supplier.
- If a machine starts to vent gas when it is running it should be moved to an area away from any sources of ignition and stopped. If it vents when static the machine should not be started, all potential sources of ignition should be inhibited until the venting has stopped and the local Ransomes Jacobsen dealer should be contacted.
- Where practical LPG fuelled vehicles should be parked in the open air, in a well ventilated position. Where this is not reasonably practical due to lack of space, security ect. vehicles should be parked inside suitably designed buildings or garages. Please refer to HELA publication LAC No. 52/6 rev

DANGER - Indicates an imminently hazardous situation which, if not avoided, **WILL** result in death or serious injury.

WARNING - Indicates a potentially hazardous situation which, if not avoided, **COULD** result in death or serious injury.

CAUTION - Indicates a potentially hazardous situation which, if not avoided, **MAY** result in minor or moderate injury and property damage. It may also be used to alert against unsafe practices.

IMPORTANT: Transport speed is for highway use only. Never select transport speed on grass areas or uneven or unsurfaced roads or tracks.

The operating Instructions for the Cutting Units are contained in a separate Publication .

**WARNING**

California Proposition 65
Engine Exhaust, some of its constituents,
and certain vehicle components contain
or emit chemicals known to the state of
California to cause cancer and birth
defects or other reproductive harm.

**WARNING**

Batteries produce explosive gases and
contain corrosive acid and supply levels
of electrical current high enough to cause
burns.

**WARNING**

Cutting Unit Transport Latches are a
Secondary Safety Device.

When Transporting the machine the
Cutting units should be held in the
Transport position on the Hydraulics with
the Transport Latches Engaged.

1. Park the machine on level ground.
2. Whilst seated in the driving position
With the engine at operating speed
raise the cutting units fully by
operating lift levers, return the lever to
the neutral position.

DO NOT move the lever into the
lower position.

3. Disengage drives, stop the engine and
make sure all moving parts are
stationary. Apply brakes and remove
the starter key.
4. Transport latches can now be engaged
or released.

Before releasing transport latches
it is important that all cutting units
are fully raised.

**WARNING**

Battery posts, terminals and related
accessories contain lead and lead
compounds

WASH HANDS AFTER HANDLING

**WARNING**

Hydraulic Fluid escaping under pressure
can penetrate skin and do serious
damage. Immediate medical assistance
must be sought.

**WARNING**

DO NOT USE ON SLOPES GREATER THAN 15°

**WARNING**

VENTING GAS CAN CAUSE FROST BITE

4.1 ENGINE SPECIFICATION

TYPE: Kubota 28Kw @ 3000rpm, 4 cylinder (in-line) vertical Diesel engine, 4-stroke, water cooled, 1498cc, with 12v electric start.

Model: V1505-BBS-EC-1

Maximum Speed: 3000 +/-50 RPM (No load)

Idle Speed: 1500 +100/-0 RPM

Oil Sump Capacity: 6.4 litres

Fuel: No. 2-D Diesel fuel (ASTM D975)

Coolant Capacity: 5 litres 50/50 Anti-freeze

Coolant Specification: Ethylene glycol anti-freeze with softened water.

4.1.2 LPG

TYPE: Ford 25Kw @ 3000rpm, 4 cylinder (in-line) vertical Petrol engine, 4-stroke, water cooled, 1297cc, with 12v electric start.

Model: VSG 413

Maximum Speed: 3150 ± 50 RPM (No load)

Idle Speed: 850 ± 50 RPM

Oil Sump Capacity: 3.1 litres

Fuel: LPG (Propane)

Coolant Capacity: 5 litres 50/50 Anti-freeze

Coolant Specification: Ethylene glycol anti-freeze with softened water.

4.2 MACHINE SPECIFICATION

Frame construction: Heavy duty formed steel chassis.

Transmission: Hydrostatic power provided by a servo-controlled transmission pump. Driving 4 individual wheel motors with a patented parallel/series transmission system. Selectable forward all wheel drive lock and reverse front axle diff lock facility.

Cutting unit drive: Hydraulic, with forward, neutral, reverse control valve. Electric dash mounted switch for on/off control, with floor mounted switch for cylinder engage. Hand control valve for reel speed adjustment

Speeds:

Cutting: 12 km/h

Transport: 25 km/h

Reverse: 6 km/h

Steering: Hydrostatic powered steering to rear wheels.

Tyres:

Front - 26 x 12 -12 Dico Multi-Trac

Rear - 20 x 10 - 8 Multi-Trac

Pressures: All tyres 1.0 kg/cm

Ground pressure: 1.0 kg/cm

Brakes, Service: Positive hydrostatic braking.

Parking: Fail safe, Oil immersed wet disc brakes.

Fuel Tank

Capacity Diesel: 45 Litres

Capacity LPG: 72 Litres

Hydraulic Tank

Capacity: 35 Litres

Battery: Exide 093

4.3 DIMENSIONS

Width of cut: 2.14 metres

Transport width: 1.6 metres

Overall height: 1.58 metres

Overall length: 2.68 metres

Overall weight of machine:

Diesel 1360*Kg

LPG 1388*Kg

* With 6 knife fixed head magna units, full fuel tank, and optional Lighting and Beacon kits

Wheel Track: 1.6 metres

Wheel Base: 1.5 metres

Uncut Circle: 0.75 metres Radius

4.4 VIBRATION LEVEL

The machine was tested for whole body and hand/arm vibration levels. The operator was seated in the normal operating position with both hands on the steering mechanism. The engine was running and the cutting device was rotating with the machine stationary.

Standard ISO 5349: 1986 Mechanical vibration. Guidelines for the measurement and the assessment of human exposure to hand-transmitted vibration.

Parkway 2250 Plus Series WB Hand / Arm Acceleration level	Max LH or RH Accelerations m/s ²		
	X Aeq	Y Aeq	Z Aeq
	0,346	0,394	0,337
Dominant Value	0,394		

Standard ISO 2631-1: 1985 Evaluation of human exposure to whole body vibration -- Part 1: General requirements.

Parkway 2250 Plus SeriesWB Whole Body Acceleration level	Floor Location Accelerations m/s ²			Seat Location Accelerations m/s ²		
	x	y	z	x	y	z
Mean	0.0253	0.0200	0.0700	0.0219	0.0125	0.0253

4.5 SLOPES**DO NOT USE ON SLOPES GREATER THAN 15°**

The slope 15° was calculated using static stability measurements according to the requirements of EN 836.

4.6 RECOMMENDED LUBRICANTS

Engine oil: Should be to MIL-L-2104C or to A.P.I. Classification SE/SF/SG grades. [10W-30]

TEMPERATURE	OIL VISCOSITY
ABOVE 4°C (39°F)	SAE30
BELOW 4°C (39°F)	SAE5W-30 or 10W-30

Hydraulic Oil: Shell Tellus 46 to ISO VG46, or equivalent

Grease: Shell Darina R2, or equivalent.

4.7 CUTTING PERFORMANCE

47 cuts per meter at 12 km/hr with 8 knife floating head units.

65 cuts per meter at 12km/hr with 11 knife floating head units.

24 cuts per meter at 12 km/hr with 4 knife fixed head units.

35 cuts per meter at 12 km/hr with 6 knife fixed head units.

4.8 CUTTING PERFORMANCE (AREA)

2.3 Hectares/hour at 12 km/hr with float head units.

2.3 Hectares/hour at 12 km/hr with fixed head units.

A 10% allowance is included for normal overlaps and turning at the end of each cut.

5.1 LUBRICATION AND MAINTENANCE CHART DEISEL POWERED MACHINES

White bullet points are workshop maintenance procedures								
	Daily	Weekly/ Every 40 hours	First 50 hours	Every 100 hours	Every 200 hours	Every 400 hours	Every 800 hours	End of Season
ENGINE								
Check oil level	●							
Change oil			●		●			
Check air filter element	●							
Replace air filter element						●		
Check Coolant level	●							
Change Coolant								●
Replace oil filter cartridge			●		●			
Replace plastic inline fuel filter						●		
Check fuel filter for water contamination				●				
Replace fuel filter cannister.						●		
Check & Clean Bug screen	●							
MACHINE								
Check Transmission Pedal for Free Movement	●							
Check tyre pressure	●							
Check hydraulic fluid level	●							
Check engine bay for debris	●							
Check nuts & bolts for tightness		●						
Check hydraulic fittings for tightness		●						
Check battery condition		●						
Replace hydraulic filter element								As Required/End of season
Change hydraulic oil							●	Or end of season
Lubricate the following with Shell Darina R2 grease								
Axle Pivot		●						
Stub Axle Pivots		●						
Rear wheel Bearings (2WD)		●						
Steering Ram Rod-end		●						
Steering linkage Rod-ends		●						
Unit pivot brackets		●						
Lift arm pivots		●						
Cutting cylinder bearings		●						
Roll bearings		●						

5.2 LUBRICATION AND MAINTENANCE CHART LPG POWERED MACHINES

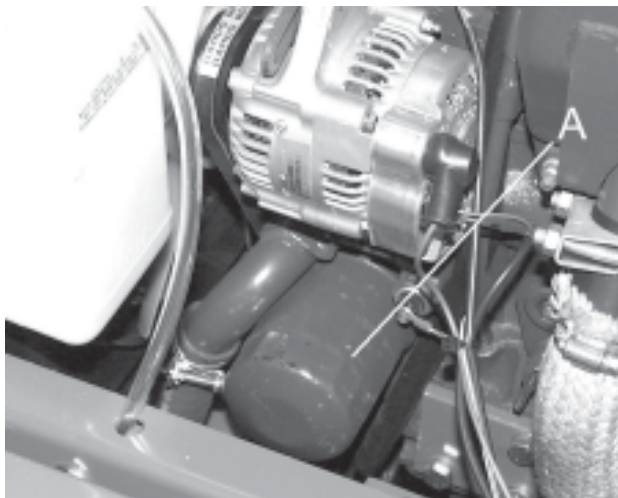
White bullet points are workshop maintenance procedures						
	Daily	Weekly/ Every 40 hours	Every 200 hours	Every 400 hours	Every 800 hours	End of Season
ENGINE						
Check oil level	●					
Change oil			●			
Check air filter element	●					
Replace air filter element				●		
Check Coolant level	●					
Change Coolant						●
Replace oil filter cartridge			●			
Check & Clean Bug screen	●					
Replace Spark Plugs						●
MACHINE						
Check Transmission Pedal for Free Movement	●					
Check tyre pressure	●					
Check hydraulic fluid level	●					
Check engine bay for debris	●					
Check nuts & bolts for tightness		●				
Check hydraulic fittings for tightness		●				
Check battery condition		●				
Replace hydraulic filter element						As Required/End of season
Change hydraulic oil					●	Or end of season
Lubricate the following with Shell Darina R2 grease						
Axle Pivot		●				
Stub Axle Pivots		●				
Rear wheel Bearings (2WD)		●				
Steering Ram Rod-end		●				
Steering linkage Rod-ends		●				
Unit pivot brackets		●				
Lift arm pivots		●				
Cutting cylinder bearings		●				
Roll bearings		●				

LUBRICATION.**5.3 ENGINE - Diesel: First 50 working hours and every 200 working hours.****Change Engine Oil.**

- (a) Warm up the engine first and then shut it off. Remove oil drain plug from the bottom of the crankcase and wipe it off.
- (b) Replace the drain plug and fill engine with 6.4 litres of oil.

Change Engine Oil Filter.

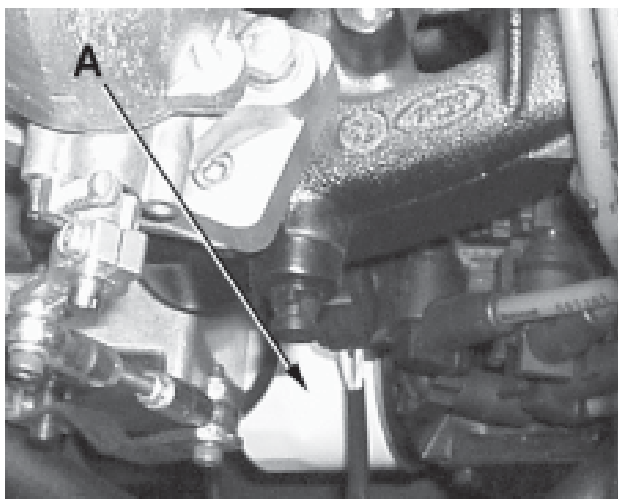
- (a) Remove single-unit cartridge (A)
- (b) Apply thin coat of oil to cartridge gasket before installing.
- (c) Tighten filter by hand only.
- (d) Check for oil leaks around the cartridge gasket after engine is started.

**5.3.1 ENGINE - LPG: Every 200 working hours.****Change Engine Oil.**

- (a) Warm up the engine first and then shut it off. Remove oil drain plug from the bottom of the crankcase and wipe it off.
- (b) Replace the drain plug and fill engine with 3.1 litres of oil.

Change Engine Oil Filter.

- (a) Remove single-unit cartridge (A)
- (b) Apply thin coat of oil to cartridge gasket before installing.
- (c) Tighten filter by hand only.
- (d) Check for oil leaks around the cartridge gasket after engine is started.

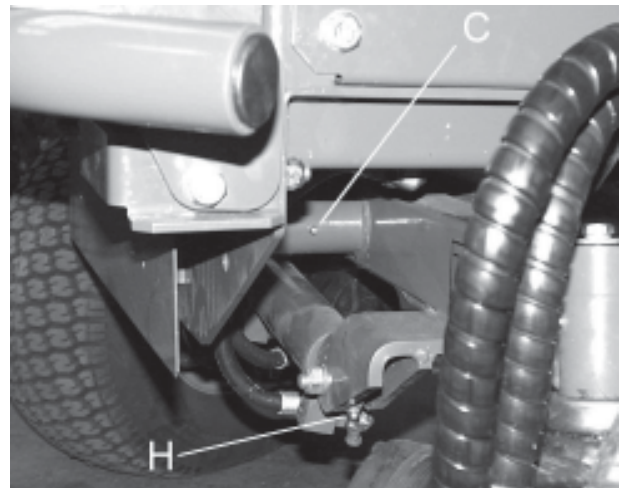
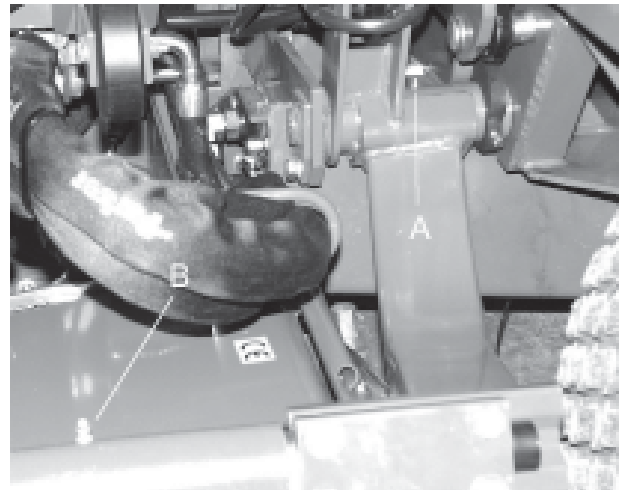
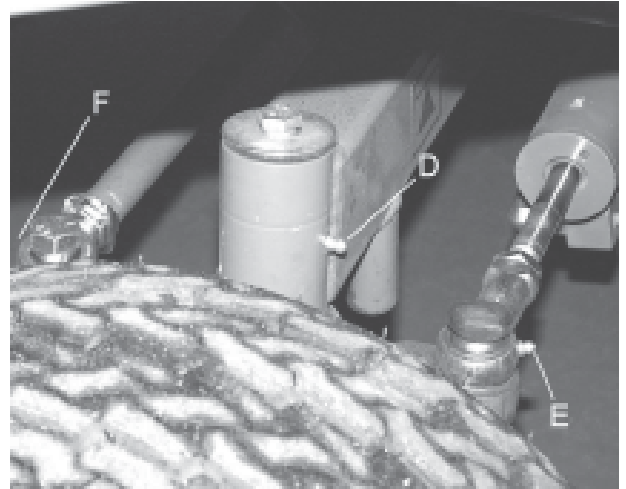


LUBRICATION.**5.4 MACHINE: Lubricate the following points. Weekly or every 40 working hours.**

1. Lubricate the following with Shell Darina R2 grease.

- (a) Lift arm pivots (A).
- (b) Cutting unit pivots (B).
- (c) Axle centre pivot (C).
- (d) Axle stub shaft pivot (D)
- (e) Steering ram rod end (E)
- (f) Steering linkage rod ends (F)
- (g) Cutting cylinder bearings and roll bearings. (Where lube points are fitted)
- (h) Rear wheel bearings (2WD Only)
- (i) Steering ram mount (G)
- (j) Spanner Height of Cut Adjusters (Where fitted)

2. Lubricate the following with engine oil:
Divertor Valve spools.



LUBRICATION.**5.5 MACHINE: Every 400 Working Hours.**

Lubrication of Direct Drive Hydraulic Motor (Every 400 hours)

Lower all cutting units onto level ground. Before leaving the driving position, stop the engine and make sure all moving parts are stationary. Apply brakes and disengage all drives. remove the starter key. The direct drive hydraulic motor can be removed from the cutting

unit by removing the two screws and washers holding the motor to the bearing housing. Carefully withdraw the motor from the bearing housing, it is important not to contaminate the motor shaft or internal splines of the cutting cylinder. If for any reason they are contaminated, they should be cleaned by degreasing. Liberally lubricate the motor and cylinder splines with Shell Malleus JB1 grease before reassembling.

5.6 MACHINE: Every 800 Working Hours.

Change Hydraulic Oil.

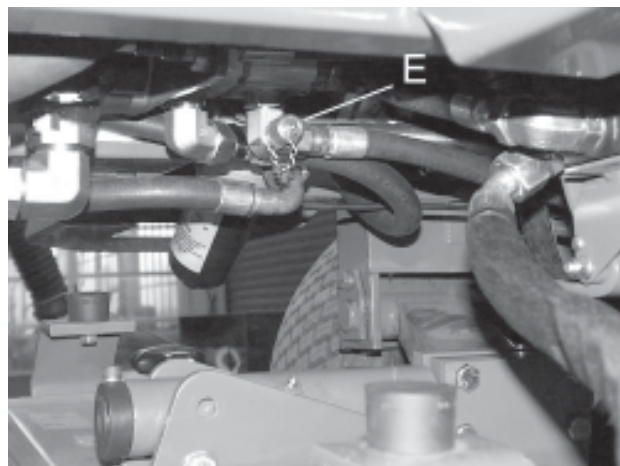
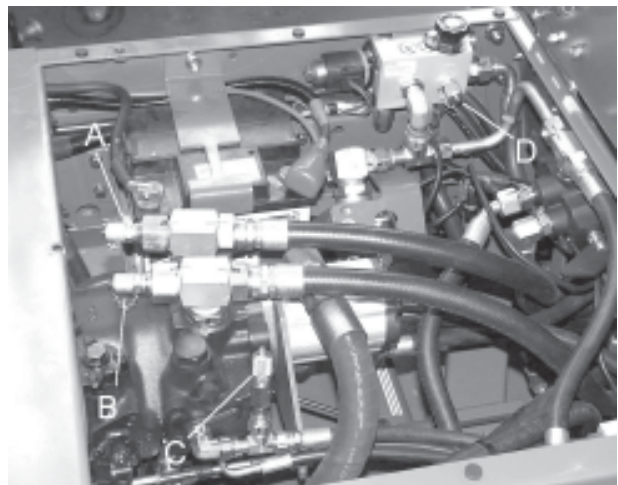
1. Remove drain plug in bottom of Hydraulic tank and wipe off plug.
2. Allow tank to drain and replace plug.
3. Refill tank with 35 litres of Shell Tellus 46 Oil.

IMPORTANT- Whenever the closed loop transmission circuit has been broken into it is essential that the circuit is flushed prior to use. Absolute cleanliness must be observed when filling the hydraulic tank. Oil must be filtered through a 25micron filter before entering the hydraulic tank.

5.7 HYDRAULIC TEST POINTS.

There are 5 test points available on the machine for conducting hydraulic system checks.

- Forward drive pressure (A)
- Reverse drive pressure (B)
- Charge pressure (C)
- Cutting cylinder drive pressure (D)
- Lift and power steering pressure (E)



MAINTENANCE**5.8 ENGINE MAINTENANCE - DIESEL**
Every 100 hrs**Fuel System.**

Use Diesel fuel No.2-D (ASTM D975)

See engine manufacturer's manual for additional information.

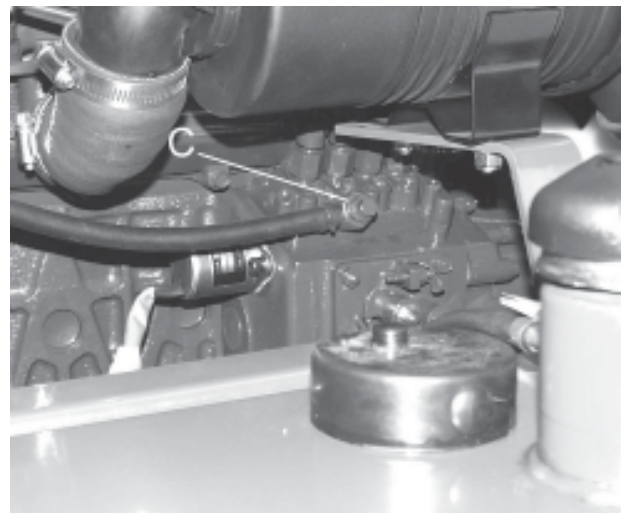
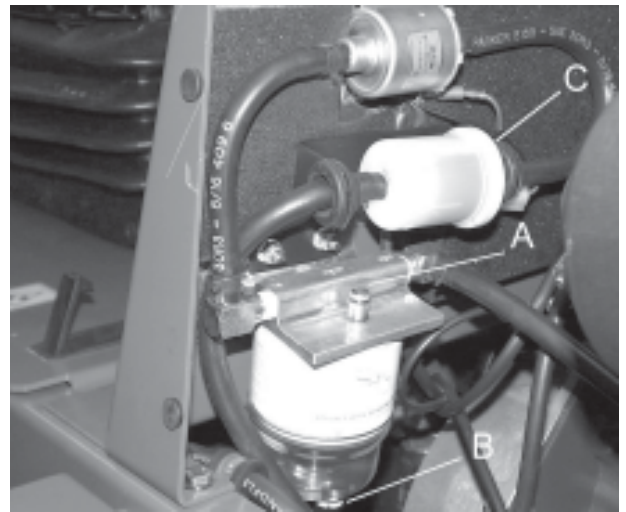
Water Separator - If water is not removed from the fuel, extensive damage can be done to the fuel injection system.

1. With engine off, open vent (A) at top of water separator.
2. Open drain valve (B) at bottom of water separator to allow any water to drain out. If water is present, it will drain first. When fuel emerges from the valve (B), close the valve. Close the vent (A).

NOTE: Failure to drain water reduces fuel filter efficiency.

Bleeding air from fuel system

1. Turn the ignition switch to the ON position (don't start engine).
2. Open air vent (C) on side of injection pump to allow air to escape.
3. Retighten air vent.
4. Turn ignition to OFF.



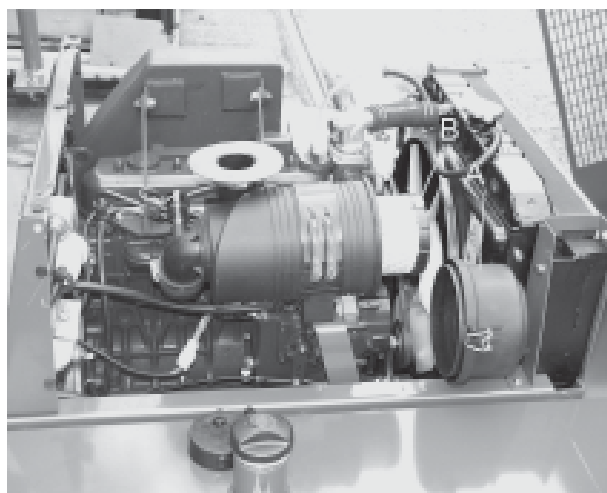
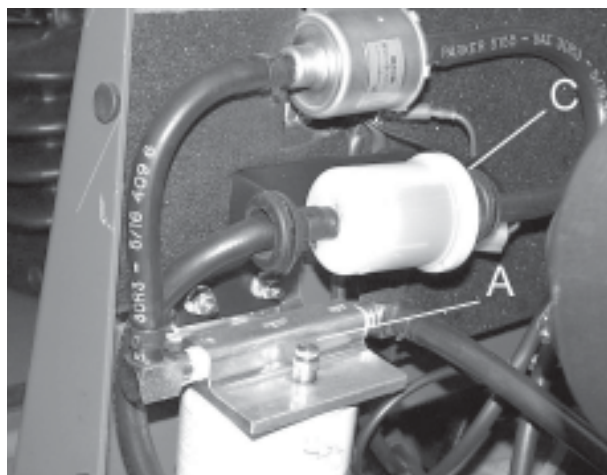
MAINTENANCE**5.9 ENGINE MAINTENANCE - DIESEL**
Every 400 hrs**Replace In-line fuel (C)****Cleaning the air filter**

Remove loose dirt from element with compressed air working from the clean to dirty side, using compressed air max 6 bar , with nozzle 5cm from element.

Change air filter (Or every 6 cleanings)

1. Raise bonnet.
2. Remove end cap of air filter cartridge.
3. Remove accumulated dust or dirt.
4. Remove filter element (B) (pull straight out firmly)
5. install new filter element (press firmly against rear shoulder)
6. Replace end cap and fasten with clips

NOTE: Extensive damage to engine can result from an inadequate air supply.

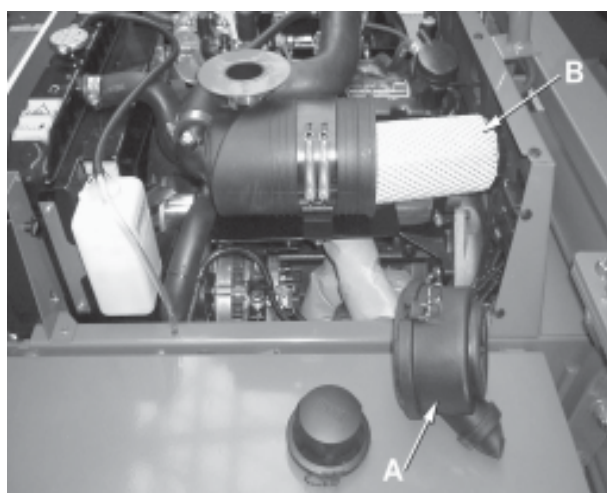
**5.9.1 ENGINE MAINTENANCE - LPG**
Every 400 hrs**Cleaning the air filter**

Remove loose dirt from element with compressed air working from the clean to dirty side, using compressed air max 6 bar , with nozzle 5cm from element.

Change air filter (Or every 6 cleanings)

1. Raise bonnet.
2. Remove end cap of air filter cartridge.
3. Remove accumulated dust or dirt.
4. Remove filter element (B) (pull straight out firmly)
5. install new filter element (press firmly against rear shoulder)
6. Replace end cap and fasten with clips

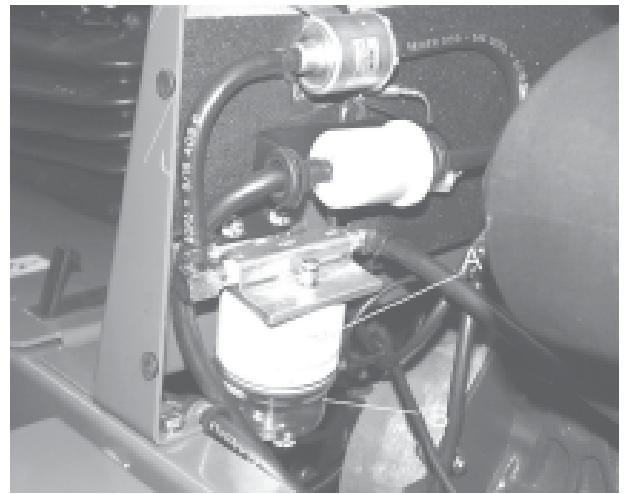
NOTE: Extensive damage to engine can result from an inadequate air supply.



MAINTANACE

5.10 ENGINE MAINTENANCE - DIESEL
Every 400 hrs**Changing fuel filter**

1. Unscrew filter (A) from filter head.
2. Remove water (B) separator from filter and discard filter.
3. Fit water separator to new filter and refit filter to head.
4. Bleed air from system as describe in section 5.6.

**5.11 MACHINE MAINTENANCE****Battery.**

Keep fluid levels above battery plates.

	WARNING	
Wear eye protection when servicing battery.		

	WARNING	
Battery posts, terminals and related accessories contain lead and lead compounds		
WASH HANDS AFTER HANDLING		

Other Regular Service.

- Verify proper operation of safety interlock switches (Parking Brake, Seat switch, etc.)
- Ensure nuts and bolts remain tight.
- Keep tyre pressure at 1kg/cm² (14psi).
- Follow the engine manufacturer's maintenance recommendations.
- If a label becomes worn or removed, see the LABELS section of this manual or the tractor Parts Manual for replacement information.

NOTE: When washing machine with pressure spray washers or steam cleaners, avoid washing bearing areas because cleaning solutions might penetrate bearing seals and cause premature bearing failure.

Storage

- Store petrol or diesel fuel in an approved container in a cool dry place.
- Keep the machine and fuel containers in a locked storage place to prevent tampering and to keep children from playing with them.
- Do not store fuel or petrol/diesel fuel powered equipment in any closed area where heating appliances, pilot lights or any sort of open flame is present.
- Before storing, allow the engine to cool, and drain fuel completely from fuel tanks and containers.
- Maximum safety and best mowing results can only be expected if the mower is maintained and operated properly.

MAINTENANCE**5.12 END OF SEASON or when required****Change Hydraulic filter.**

1. Lower the centre cutting unit to improve access.
2. Wipe filter bowl (A) and housing to remove any dirt present.
3. Place a suitable drip tray on top of the centre cutting unit.
4. Unscrew bowl and remove oil filter element and dispose of safely.
5. Replace with new element.
6. Coat the top outside lip of the filter bowl with a thin film of oil and refit filter bowl and torque to 54Nm, as indicated on decal.
7. Start engine and idle for 15 seconds.
8. Stop engine, check filter bowl for leaks and check reservoir

NOTE: It is important that absolute cleanliness is observed when changing the filter.

Change Coolant.

1. Completely drain the cooling water from the radiator drain plug (B) and flush the cooling system with flushing detergent.
2. Check for leaks or loose connections at the radiator, cylinder head gasket, drain cock etc.
3. Mix antifreeze coolant and water at the specified ratio before pouring into the engine.

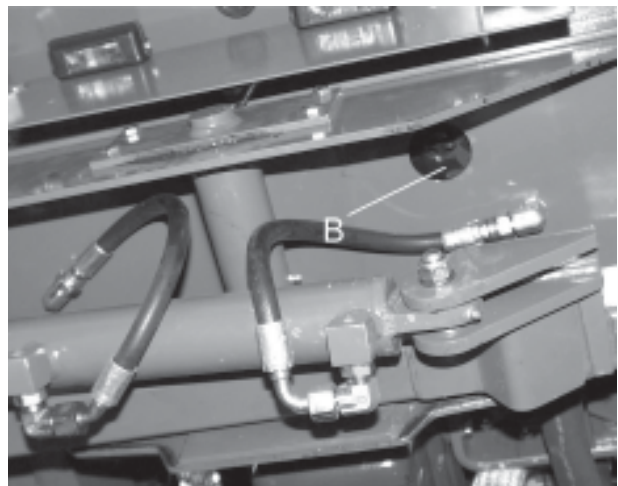
Note: When topping up the cooling system fill with a 50/50 solution.

Check Rear Wheel Bearings. (2WD Only)

1. Jack up, and securely chock the rear of the machine using points indicated in section 5.2
2. Check for free-play in bearings,
3. If free-play is found remove dust cover and split pin and tighten castladed nut till all free-play is eliminated.

Transmission Foot Pedal & Cable

Inspect the cable for damage and freedom of movement. Fully cycle the cable to check that the inner element is in good condition. Inspect the outer sheath for damage and alignment. Correct or replace as appropriate



MAINTENANCE**5.12.1 END OF SEASON or when required
LPG Engine****Change Spark Plugs**

1. Remove the lead from each spark plug by grasping, twisting and then pulling the moulded boot on the end of the lead.

**CAUTION**

Do not pull directly on the lead as this could cause the wire connection inside the boot to become seperated.

2. After lossening each spark plug one or two turns with a proper spark plug spanner, clean the area around each spark plug port with compressed air then remove the spark plugs.

**CAUTION**

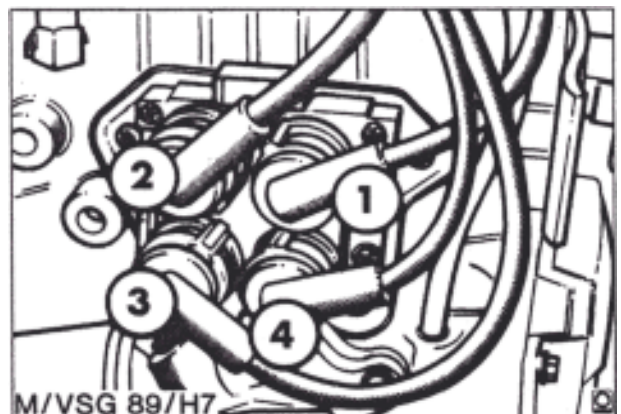
When using a compressed air line, safety goggles must be worn to protect the eyes.

3. Check the gaps of the new spark plugs with feeler gauges and where necessary, bend the electrode to achive the specified gap.
4. Smear the threads of the new spark plugs with 'Never Seez' then using a proper spark plug spanner to avoid damaging the insulators, screw the new spark plugs into the cylinder head and tighten them to the the specified torque value.

NOTE: Do not over tighten spark plugs as the gap may change considerably due to the distortion of the plug outer shell.

5. Coat the inside of each spark plug boot with Silicone dielectric compound D7AZ-19A331-A or equivalent, using a small screwdriver blade.
6. Re-connect each high tension lead to the correct spark plug.

Be sure each lead is fully pressed onto each plug and that the moulded boot is firmly in place.



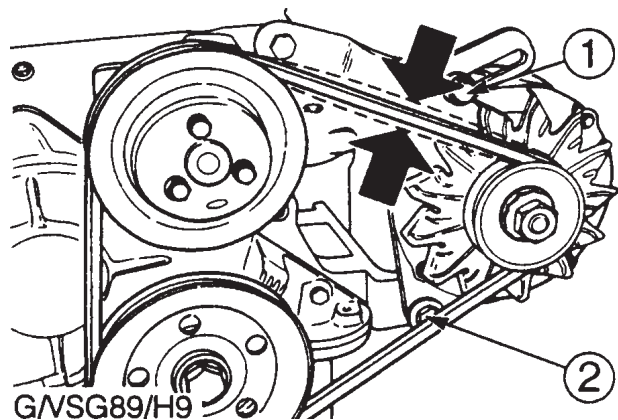
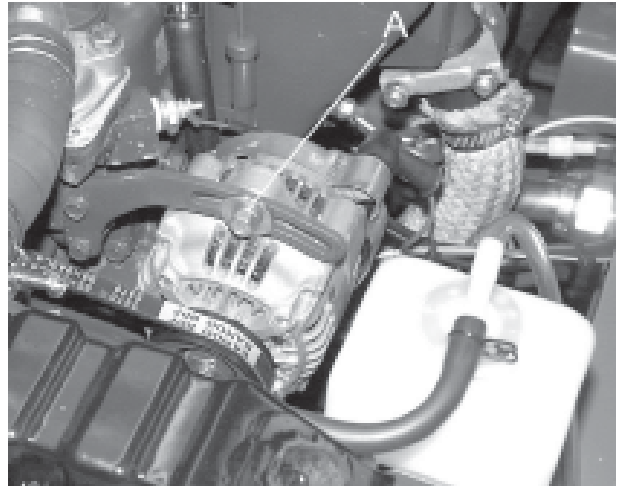
ADJUSTMENTS**6.1 SPEED LIMITER.**

The transport and mow speeds of the machine are factory set and should not be altered. Textron Turf Care cannot be held responsible for loss of performance or machine damage if these speeds are altered.

**6.2 ALTERNATOR/WATER PUMP - DIESEL
ALTERNATOR/WATER PUMP/FAN - LPG**

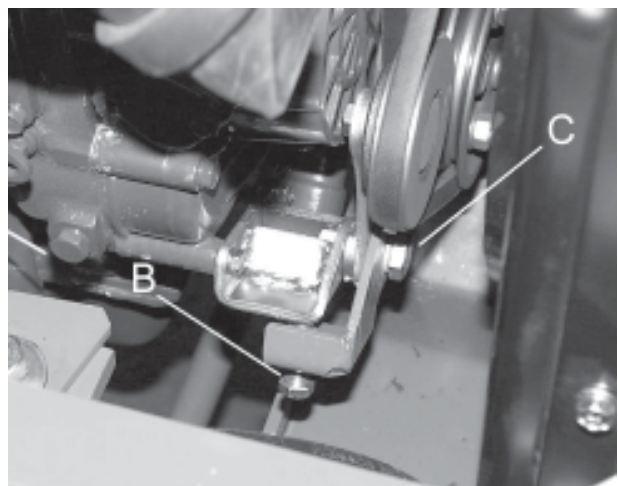
The water pump belt is adjusted so that it has sufficient tension to avoid undue stress on alternator bearings but does not slip on the alternator pulley. Use the following procedure to check the belt tension at the mid-point of the belt between crank shaft and alternator pulleys.

1. Loosen alternator bolt (Diesel A / LPG 1 & 2) and pivot bolt on the underside of the Alternator.
2. Move the alternator to tighten or loosen the belt so that a deflection of 7 to 9 mm is achieved at the mid-span with a load 10Kgf (98N/22lbs) for a new belt, and 8 to 10mm for a used belt.
3. Re-tighten bolts .

**6.3 COOLING FAN BELT - DIESEL**

The cooling fan belt is adjusted so that it has some slack to avoid undue stress on the water pump bearing but does not slip on the pulley. Use the following procedure to check the belt tension in the span between the fan and tension pulleys.

1. Loosen tensioner bolt (C)
2. Release lock nut on bolt (B)
3. Adjust bolt (B) to obtain a belt deflection of 10 to 11mm with a load 10Kgf (98N/22lbs) for a new belt, and 11 to 11.5mm for a used belt.
4. Re-tighten bolt (C)



ADJUSTMENTS**6.4 BACKLAPPING**

This mower is fitted with a device to allow the reels to be driven in reverse for backlapping.

- Backlapping is a process which will lightly grind the reel to the bedknife whilst mounted on the mower.
- If significant amounts of metal are to be removed then the cutting unit should be reground on a specialised grinding machine.
- Before any backlapping is carried out, Ransomes Jacobsen recommends that the backlapping process should be risk assessed as a workshop process by the manager of the machine.
- Backlapping should only be carried out by trained staff.
- Ransomes Jacobsen recommend that grinding paste is only applied to the reel when it is stationery, the engine is off and the parking brake applied.
- When applying grinding paste the reel should only be rotated by appropriately sized piece of wood and not by hand.
- Place reels in the most accessible position for applying the paste.
- Leave the grass boxes in position on the cutting units as a safety barrier.
- After applying the grinding paste the person backlapping should return to the seat, engage the relevant controls and run the reels in reverse.
- When the desired finish is achieved switch off the mower, clean off any surplus paste, reset the reel to bedknife and return the controls to the normal mow positions.

Ransomes Jacobsen grinding paste:

80 grit grinding paste, 4.5kg tin,
Part number 5002488

120 grit grinding paste, 4.5kg tin,
Part number 5002489

80 grit grinding paste, 9kg tin,
Part number 5002490

120 grit grinding paste, 9kg tin,
Part number 5002491

7.1 TROUBLESHOOTING - DIESEL

The troubleshooting chart below lists basic problems that may occur during start-up and operation. For more detailed information regarding the hydraulic and electrical systems contact your area Ransomes Distributor.

Symptoms	Possible Causes	Action	Section
Engine will not start.	1. Glow Plug has not timed out.	1. Reset ignition switch and allow glow plug to time out before cranking engine.	
	2. Battery low on charge or defective.	2. Inspect condition of battery and battery connections.	
	3. Fuel tank empty or fuel contaminated.	3. Fill tank with fresh fuel. Change filter, Drain any water from sight bowl, Bleed air from lines.	5.5/5.6
	4. Blown Fuse.	4. Replace Fuse.	
	5. Defective Starter Relay.	5. Test and replace relay if necessary.	
	6. Parking brake not applied	6. Apply parking brake	
	7. Mow engage switch set to cut.	7. Disengage dash mounted mow switch.	
Engine hard to start or runs poorly.	1. Fuel tank empty or fuel contaminated.	1. Fill tank with fresh fuel. Change filter, Drain any water from sight bowl, Bleed air from lines.	5.5/5.6
	2. Air Cleaner blocked or dirty.	2. Check air cleaner indicator and replace as necessary.	
	3. Injectors, fuel pump.	3. Consult engine manual.	
	4. Other Engine Problem	4. Consult engine trouble shooting guide.	
Engine Stops.	1. Fuel tank empty	1. Fill with fresh fuel and bleed lines	5.5
	2. Interlocks not set before leaving operators seat	2. Set mow switch to off position before leaving seat.	
Engine Overheating.	1. Coolant level low	1. Inspect and add 50/50 antifreeze solution if required.	
	2. Radiator air intake restricted	2. Clean wire mesh guard at radiator.	
	3. Waterpump/alternator belt or fan belt loose or broken.	3. Inspect waterpump/alternator belt and fan belt. Tighten if necessary.	6.3/6.4
Battery not holding charge. Battery light on.	1. Loose or corroded battery terminals.	1. Inspect terminals, clean and tighten as required.	
	2. Low electrolyte level in battery.	2. Refill battery with distilled water	5.7
	3. Alternator belt loose or broken.	3. Inspect waterpump/alternator belt. Tighten if necessary.	6.3
	4. Alternator defective.	4. See engine manual.	
Cylinders cut unevenly.	1. Cylinder to bottom blade not adjusted properly.	1. Inspect cylinder to bottom blade adjustment.	
	2. Engine speed too low.	2. Check engine speed, run engine at full throttle.	
	3. Cylinder speed not adjusted for turf conditions.	3. Adjust cylinder speed for best cut.	
	4. Cylinder direction lever set in reverse.	4. Set cylinder direction lever to forward rotation.	
	5. Ground weight incorrectly adjusted	5. Adjust ground weight control valve till correct ground is achieved.	

7.1 TROUBLESHOOTING - LPG

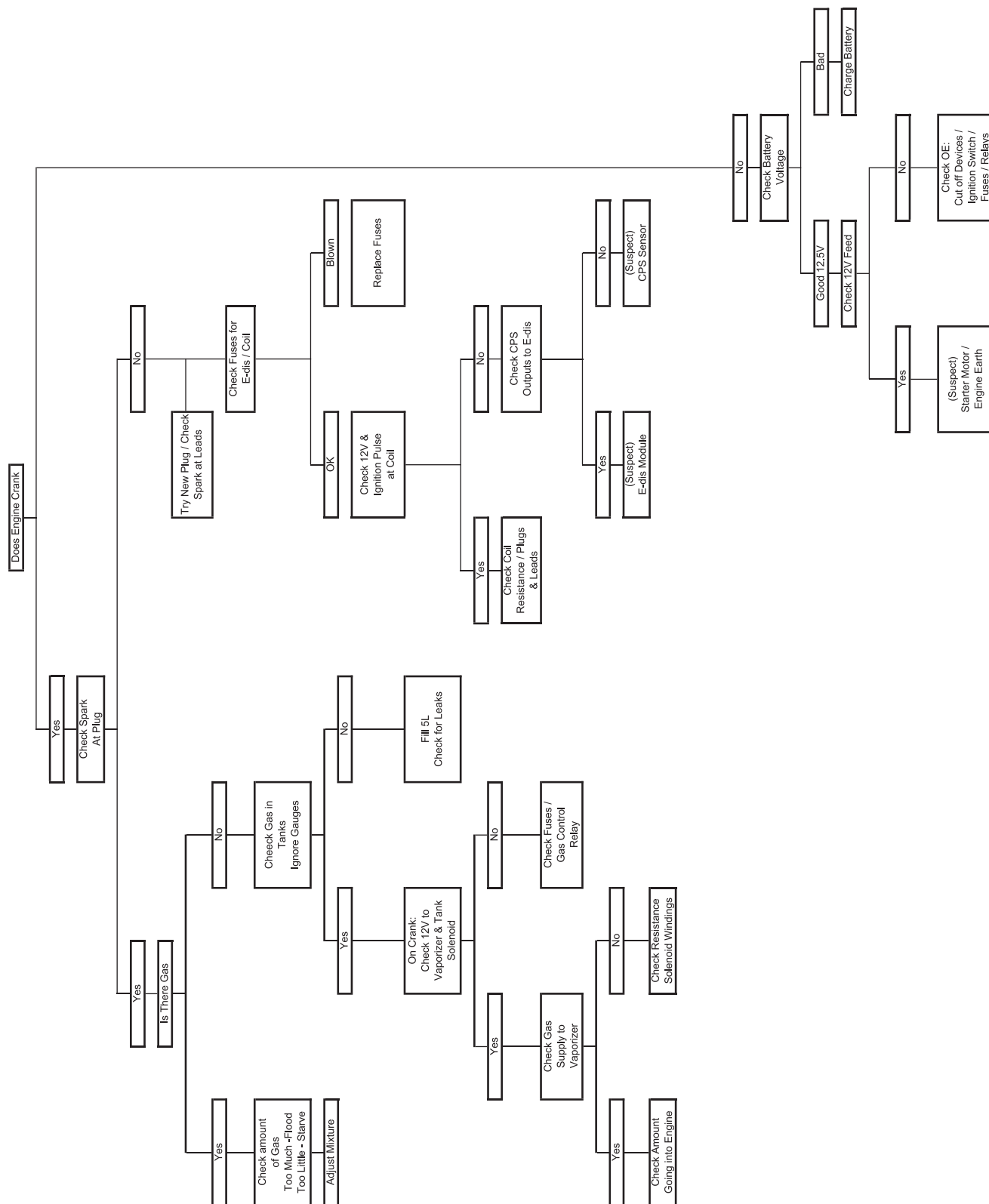
The troubleshooting chart below lists basic problems that may occur during start-up and operation. For more detailed information regarding the hydraulic and electrical systems contact your area Ransomes Distributor.

Problem	Symptoms	Possible Causes	Action	Section
Engine will not Start	Starter does not crank engine	1. Battery run down.	Put on Charge	
		2. Lead disconnected or corroded.	Reconnect or replace	
		3. Faulty starter switch.	Refer to Engine manufacturers manual	
		4. Starter drive dirty.	Refer to Engine manufacturers manual	
		5. Faulty starter motor.	Refer to Engine manufacturers manual	
	Starter cranks engine slowly	1. Battery partly run down.	Put on Charge	
		2. Terminal(s) loose.	Refer to Engine manufacturers manual	
		3. Connections dirty.	Clean connections	
		4. Faulty starter motor.	Refer to Engine manufacturers manual	
		5. Wrong grade of oil	Replace with correct grade	
	Starter cranks engine normally but will not start.	Ignition - no spark at plug gaps. 1. Spark plugs oiled up.	Refer to Engine manufacturers manual	
		Ignition - no spark at plug gaps. 2. Spark plugs insulators cracked.	Refer to Engine manufacturers manual	
		3. Lack of Fuel.	Fill fuel tank	
		4. Fuel shut-off valve not operating.	Refer to Engine manufacturers manual	
		5. Blockage in fuel line.	Refer to Engine manufacturers manual	
		6. Faulty evaporator or regulator.	Refer to Engine manufacturers manual	
		7. Air leak in inlet manifold.	Refer to Engine manufacturers manual	
	Coil - no spark at HT lead	1. Coil(s) burnt out.	Refer to Engine manufacturers manual	
		2. High tension lead loose or broken.	Refit or replace	
		3. Faulty ignition switch or low tension wiring to coils.	Refer to Engine manufacturers manual	

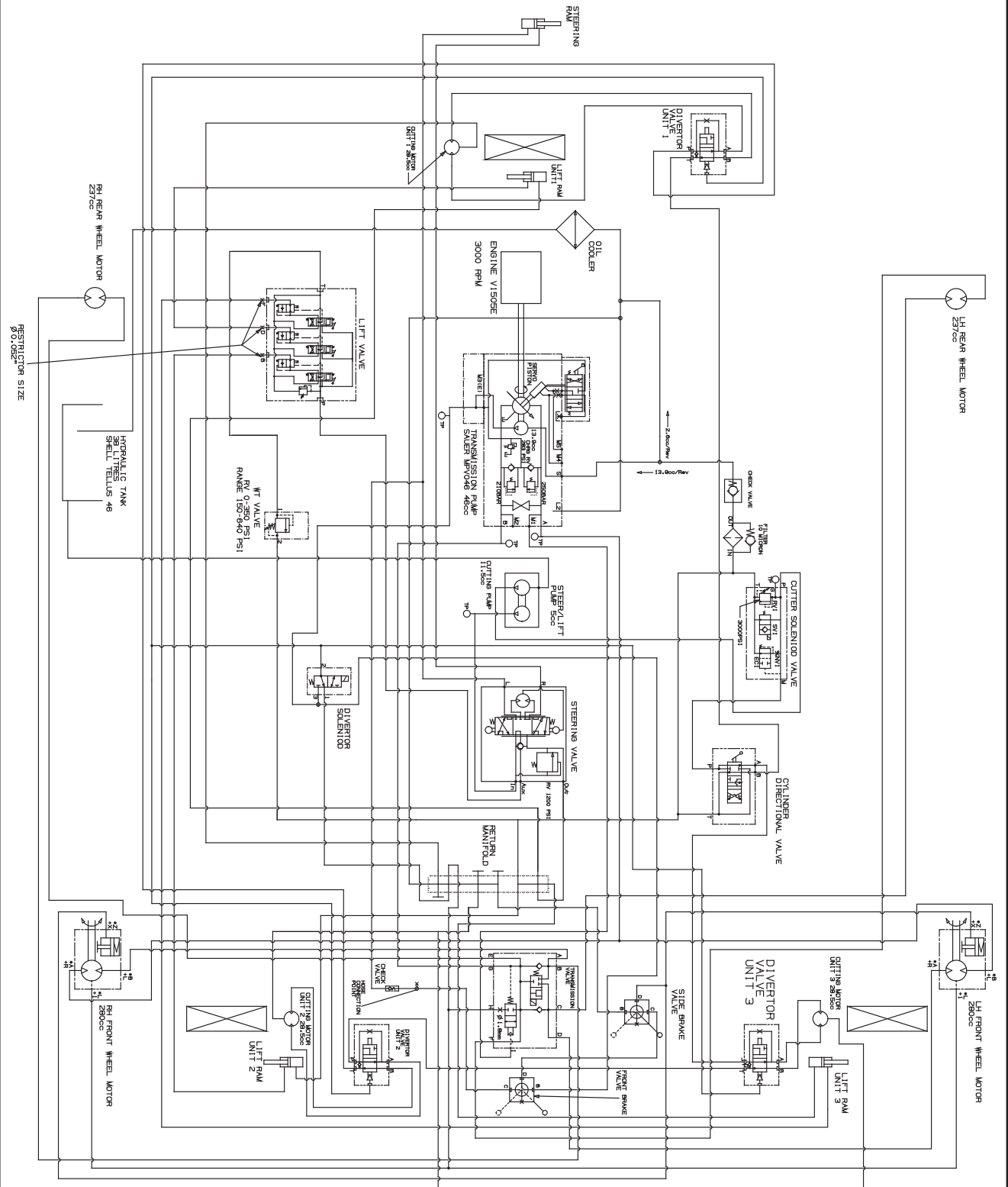
Problem	Symptoms	Possible Causes	Action	Section
Engine runs Incorrectly	Engine misfires	1. High tension leads to spark plugs shorting.	Refer to Engine manufacturers manual	
		2. Incorrect spark plug gaps.	Reset gaps	
		3. Cracked spark plug insulator.	Replace spark plug	
		4. Battery connections loose.	Tighten connections	
		5. Fuel line partly choked.	Refer to Engine manufacturers manual	
		6. Shortage of fuel.	Refer to Engine manufacturers manual	
		7. Faulty regulator.	Refer to Engine manufacturers manual	
		8. Vacuum leaks at throttle body.	Refer to Engine manufacturers manual	
		9. Valves sticking.	Refer to Engine manufacturers manual	
		10. Valves burnt.	Refer to Engine manufacturers manual	
		11. Valve spring broken.	Refer to Engine manufacturers manual	
	Engine starts and stops	1. Faulty ignition switch contact.	Refer to Engine manufacturers manual	
		2. Fuel line blocked.	Refer to Engine manufacturers manual	
		3. No fuel.	Refill fuel tank	
		4. Air leaks.	Refer to Engine manufacturers manual	
	Engine runs on full throttle only	1. Valves sticking.	Refer to Engine manufacturers manual	
		2. Valves burnt.	Refer to Engine manufacturers manual	
		3. Valve spring broken.	Refer to Engine manufacturers manual	
	Engine does not give full power	1. High tension lead shorting.	Refer to Engine manufacturers manual	
		2. Fuel supply faulty.	Refer to Engine manufacturers manual	
		3. Valve burnt or bad seating.	Refer to Engine manufacturers manual	
		4. Incorrect valve clearance.	Refer to Engine manufacturers manual	
		5. Air leaks in inlet manifold.	Refer to Engine manufacturers manual	
	Engine runs imperfectly	1. Fuel feed faulty.	Refer to Engine manufacturers manual	
		2. Inlet valve(s) not closing	Refer to Engine manufacturers manual	
	Engine knocks	1. Plug leads crossed.	Reconnect leads in correct order	
		2. Excessive carbon deposits.	Refer to Engine manufacturers manual	
		3. Worn bearing or piston.	Refer to Engine manufacturers manual	
	Engine runs too hot	1. Low coolant level.	Top up	5.12
		2. Inoperative thermostat.	Refer to Engine manufacturers manual	
		3. Dirty cooling system.	Check and clear radiator	
		4. Running engine with frozen coolant.		
		5. Ambient temperatures 50°C or higher.		
		6. Loose or broken fan belt.	Adjust or replace	6.2 / 6.3
		7. Radiator fins restricted with debris.	Check and clear radiator	
		8. Prolonged idling.		
		9. Leaky head gasket.	Refer to Engine manufacturers manual	
		10. Overloading, especially during hot weather.		

Problem	Symptoms	Possible Causes	Action	Section
Battery not holding charge.	Battery light on.	1. Loose or corroded battery terminals.	1. Inspect terminals, clean and tighten as required.	
		2. Low electrolyte level in battery.	2. Refill battery with distilled water	5.11
		3. Alternator belt loose or broken.	3. Inspect water pump/alternator belt. Tighten if necessary.	6.2
		4. Alternator defective.	Refer to Engine manufacturers manual	
Poor finish cutting grass	Cylinders cut unevenly.	1. Cylinder to bottom blade not adjusted properly.	1. Inspect cylinder to bottom blade adjustment.	
		2. Engine speed too low.	2. Check engine speed, run engine at full throttle.	
		3. Cylinder speed not adjusted for turf conditions.	3. Adjust cylinder speed for best cut.	
		4. Cylinder direction lever set in reverse.	4. Set cylinder direction lever to forward rotation.	
		5. Ground weight incorrectly adjusted	5. Adjust ground weight control valve till correct ground is achieved.	

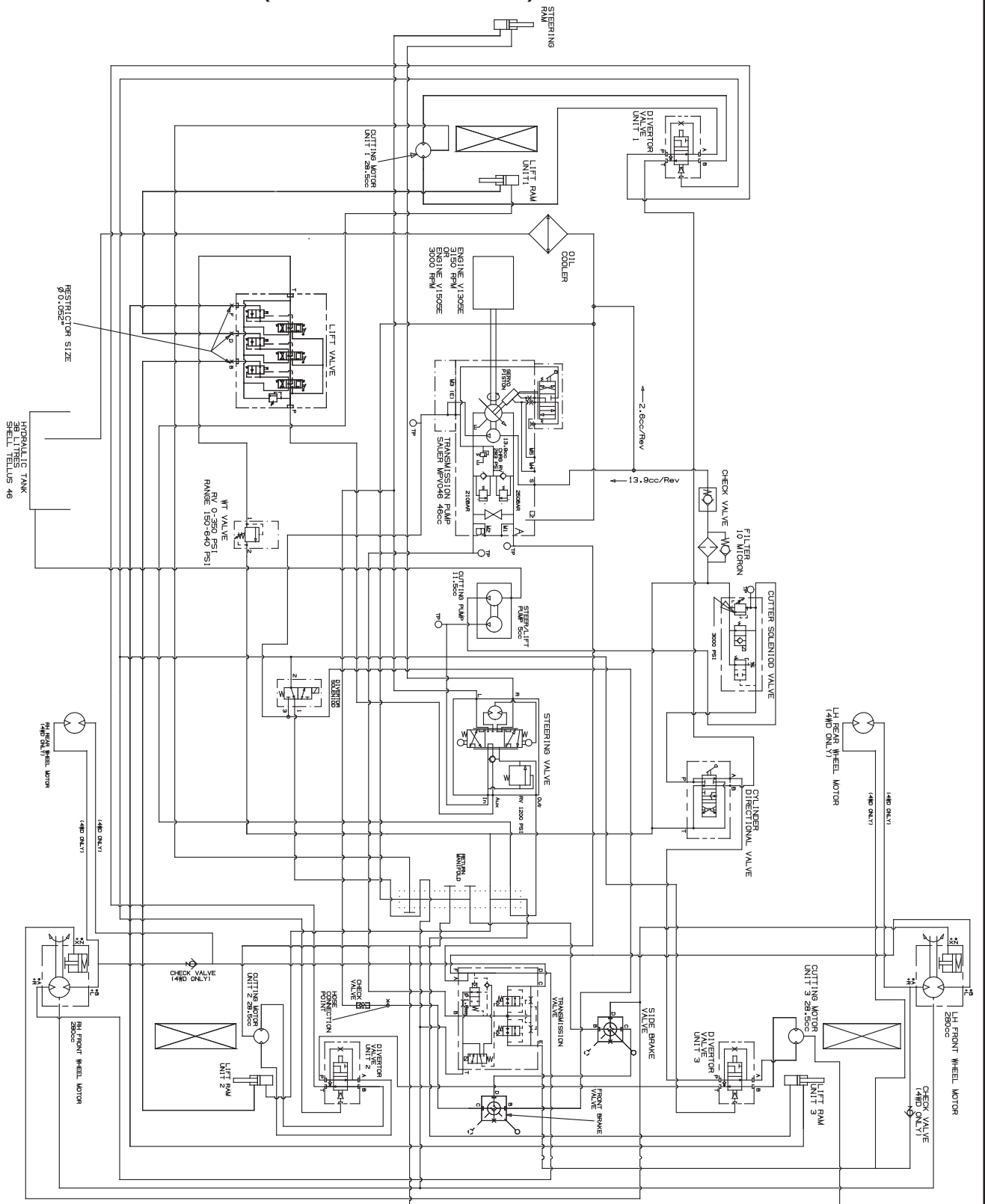
7.2 LPG FAULT FINDING FLOW CHART



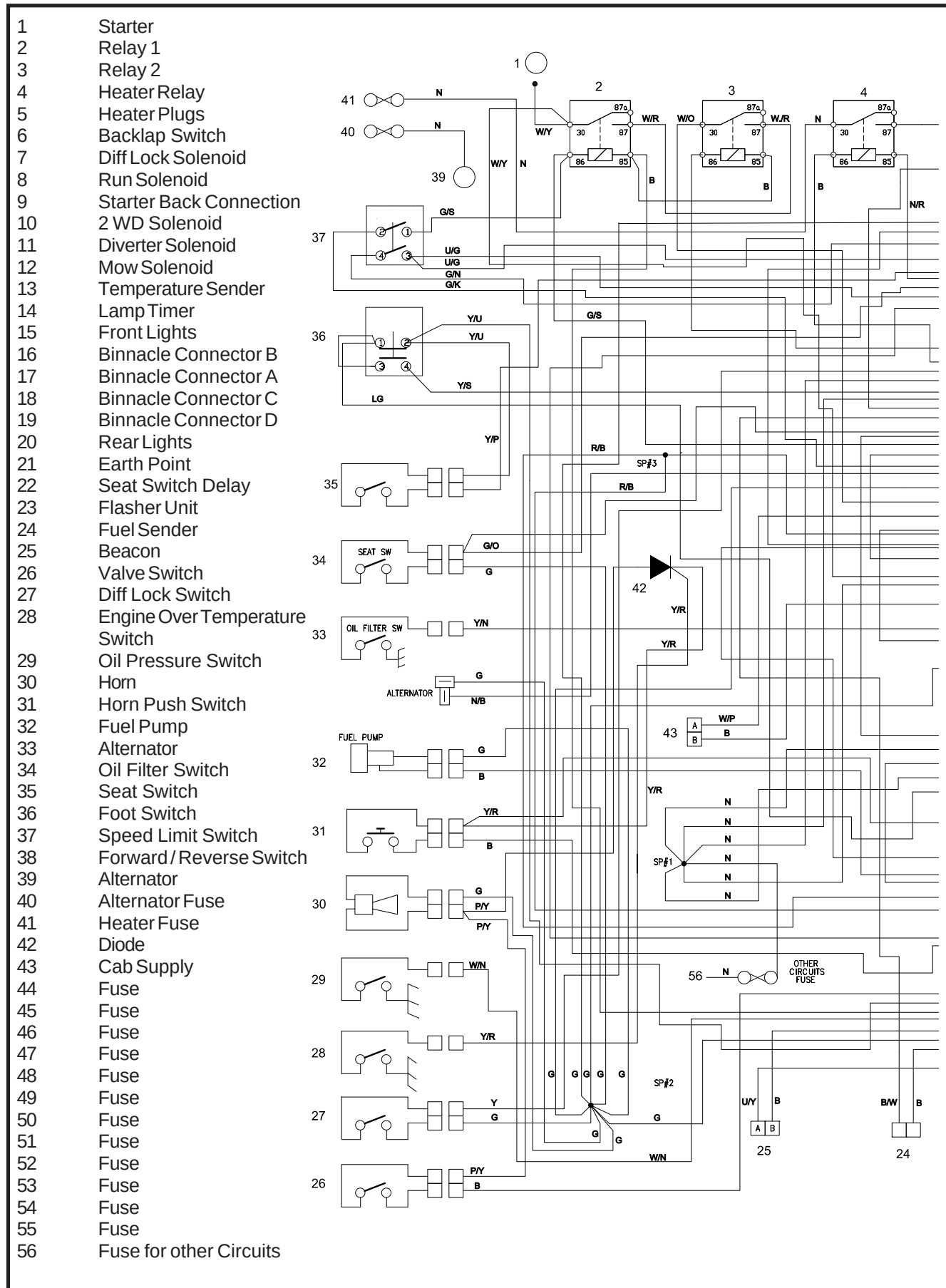
8.1 HYDRAULIC CIRCUIT (STANDARD TRANSMISSION)

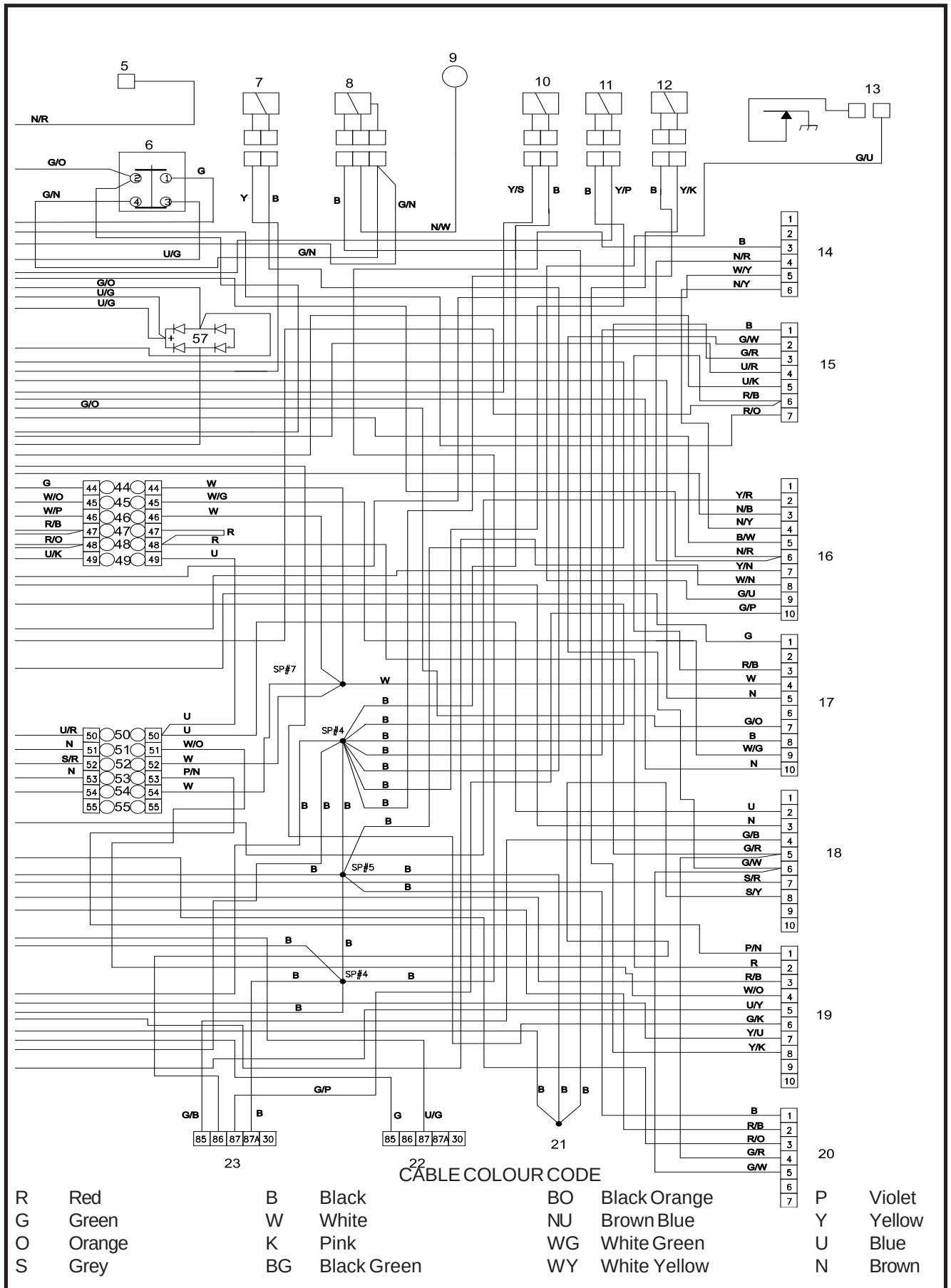


8.1 HYDRAULIC CIRCUIT (DIFF-LOCK TRANSMISSION)

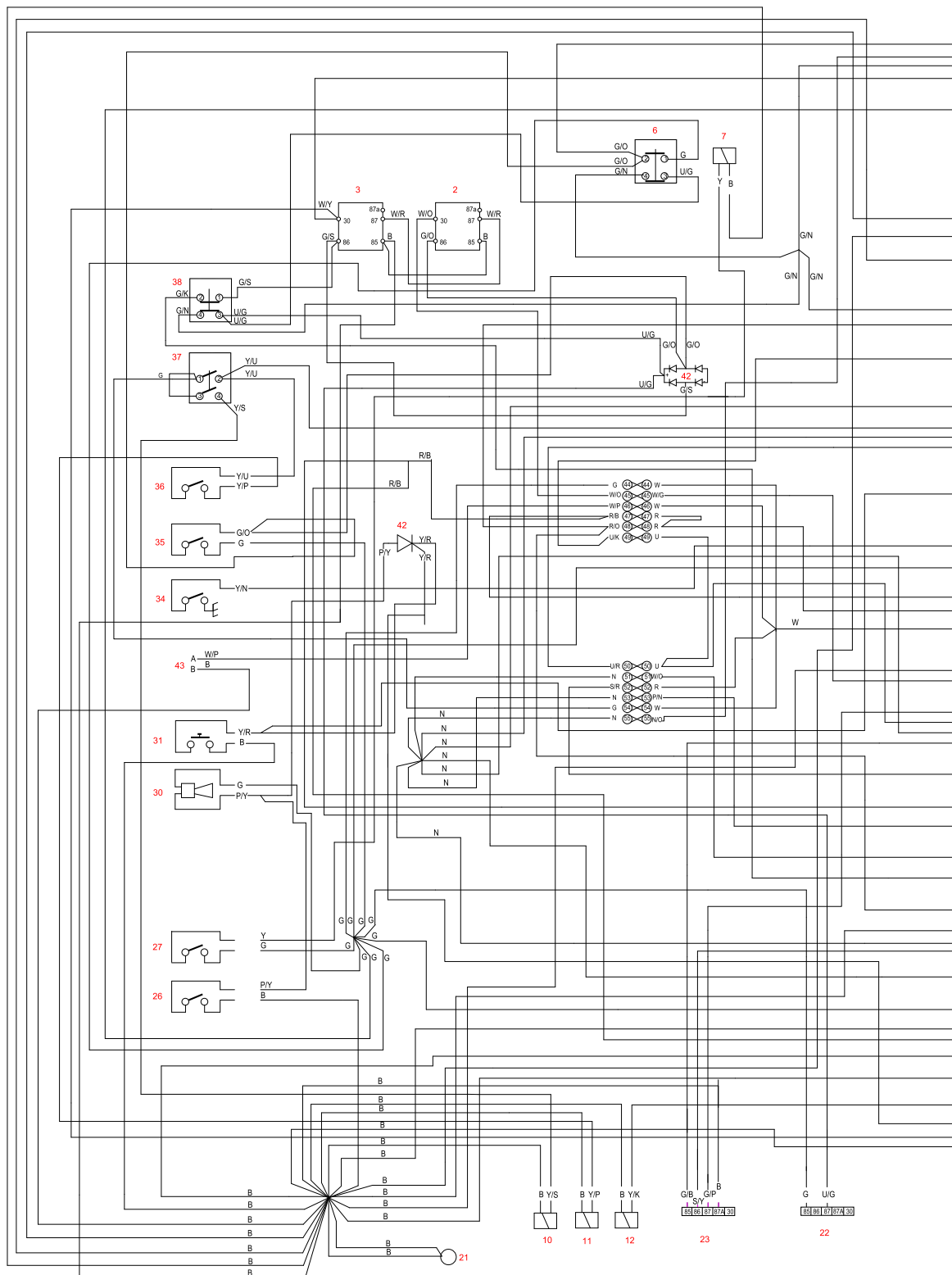


8.2 ELECTRICAL CIRCUIT ENGINE AND SAFETY DIESEL



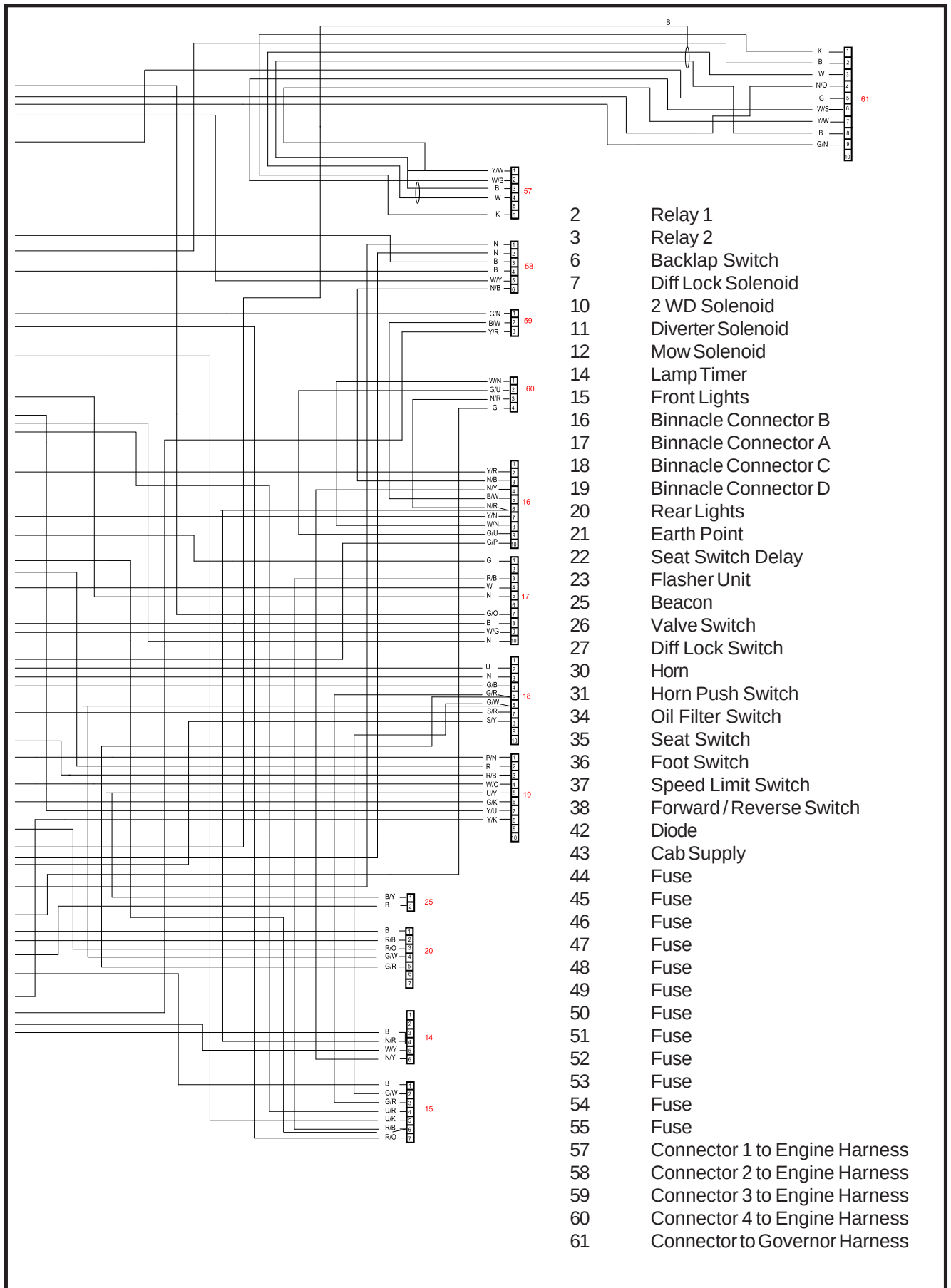


8.3 ELECTRICAL CIRCUIT MAIN LPG

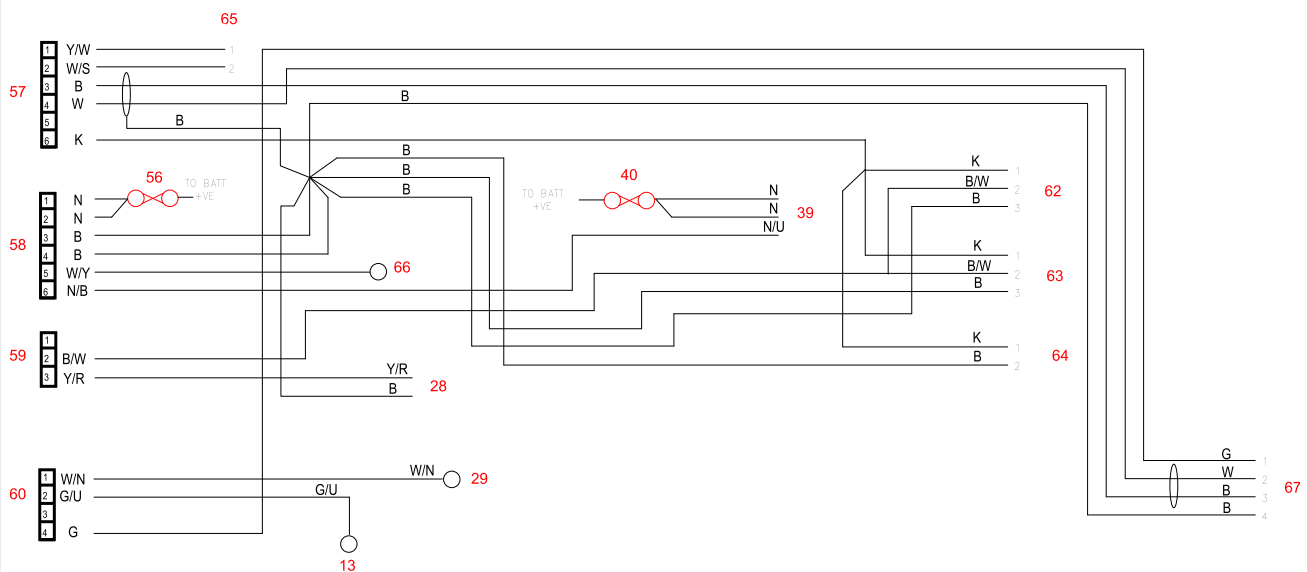


CABLE COLOUR CODE

R	Red	B	Black	BO	Black Orange	P	Violet
G	Green	W	White	NU	Brown Blue	Y	Yellow
O	Orange	K	Pink	WG	White Green	U	Blue
S	Grey	BG	Black Green	WY	White Yellow	N	Brown



8.4 ELECTRICAL CIRCUIT ENGINE LPG-1

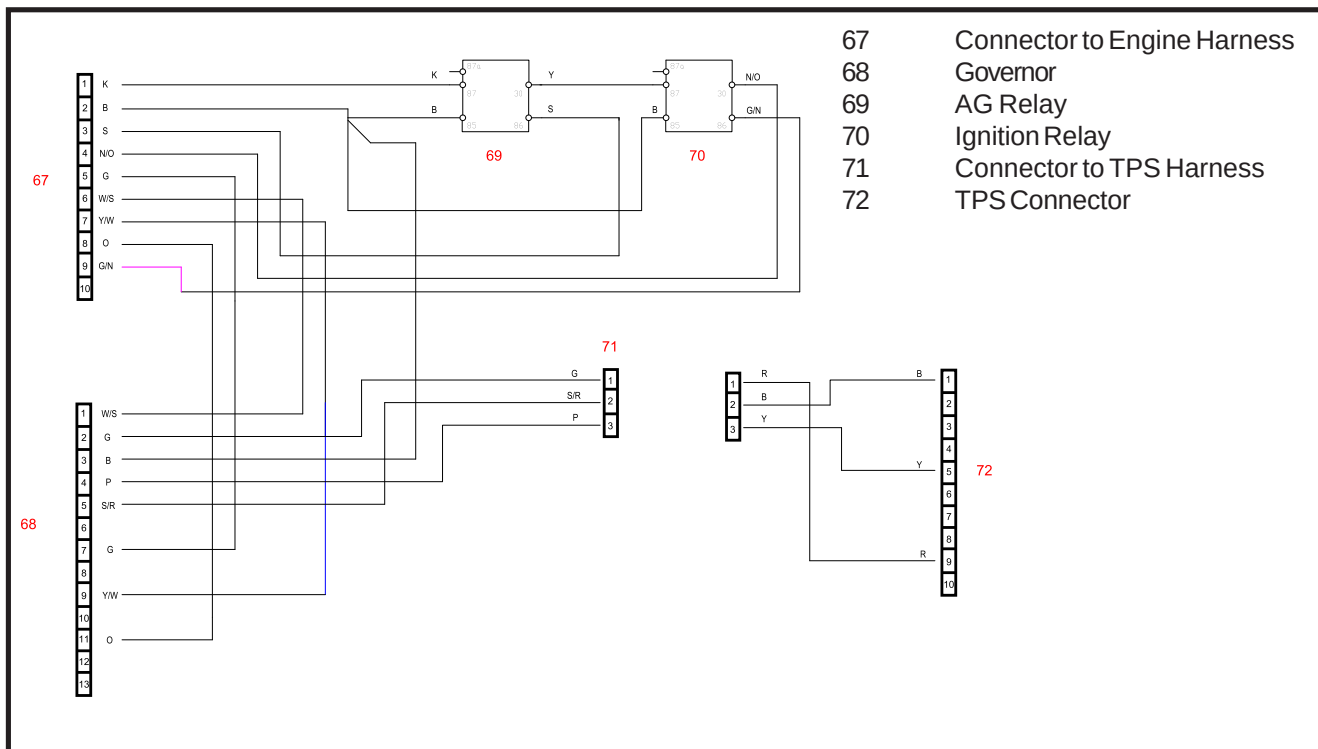


- 13 Temperature Sender
- 28 Engine Over Temperature Switch
- 29 Oil Pressure Switch
- 39 Alternator
- 40 Alternator Fuse
- 56 Fuse to Other Circuits
- 57 Connector 1 to Engine Harness
- 58 Connector 2 to Engine Harness
- 59 Connector 3 to Engine Harness
- 60 Connector 4 to Engine Harness
- 62 LPG Tank 1
- 63 LPG Tank 2
- 64 Vopouriser Solenoid
- 65 Actuator
- 66 Starter Solenoid
- 67 Connector to LPG Engine Harness

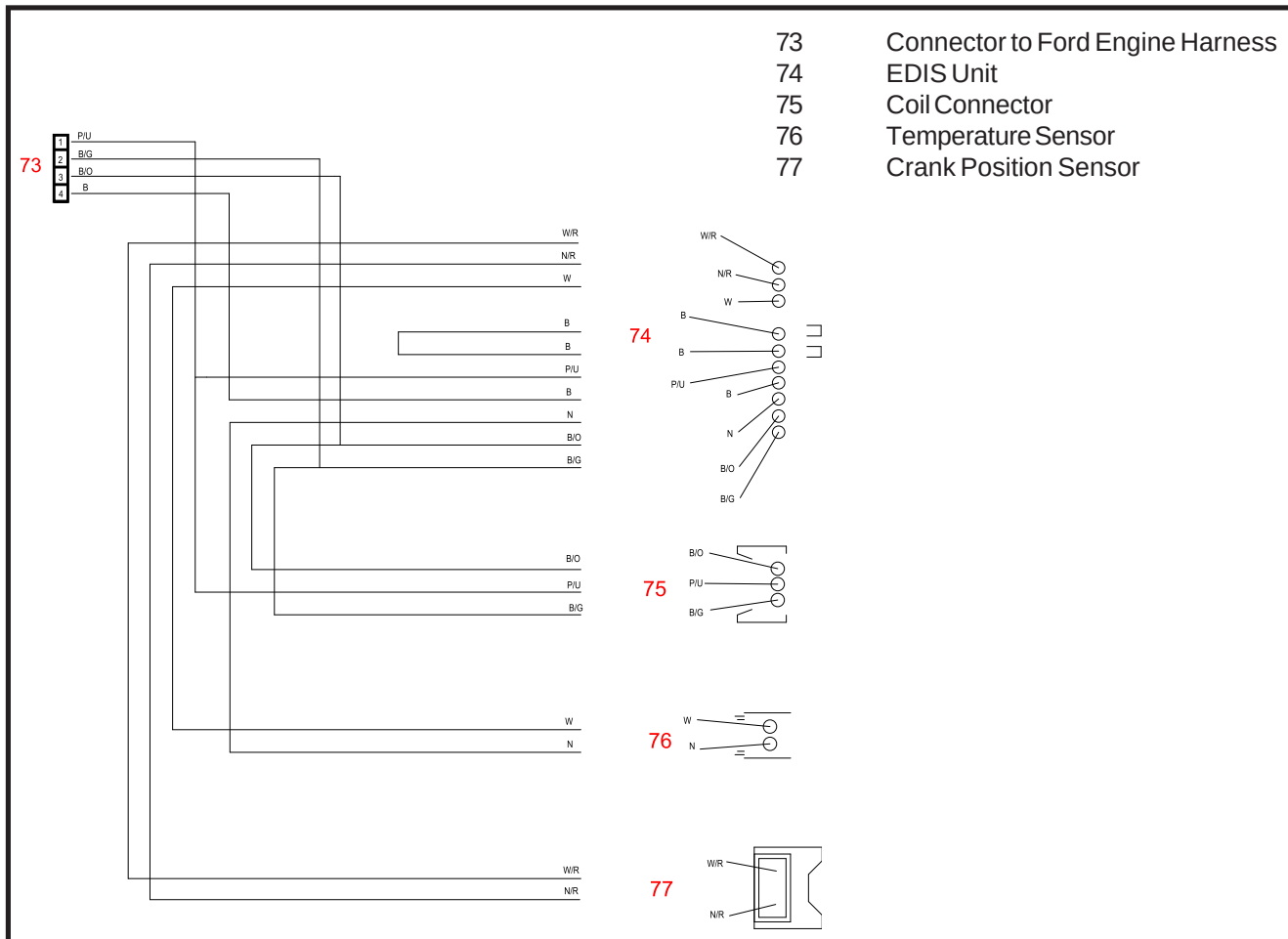
CABLE COLOUR CODE

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G	Green	W	White	NU	Brown Blue	Y	Yellow
O	Orange	K	Pink	WG	White Green	U	Blue
S	Grey	BG	Black Green	WY	White Yellow	N	Brown

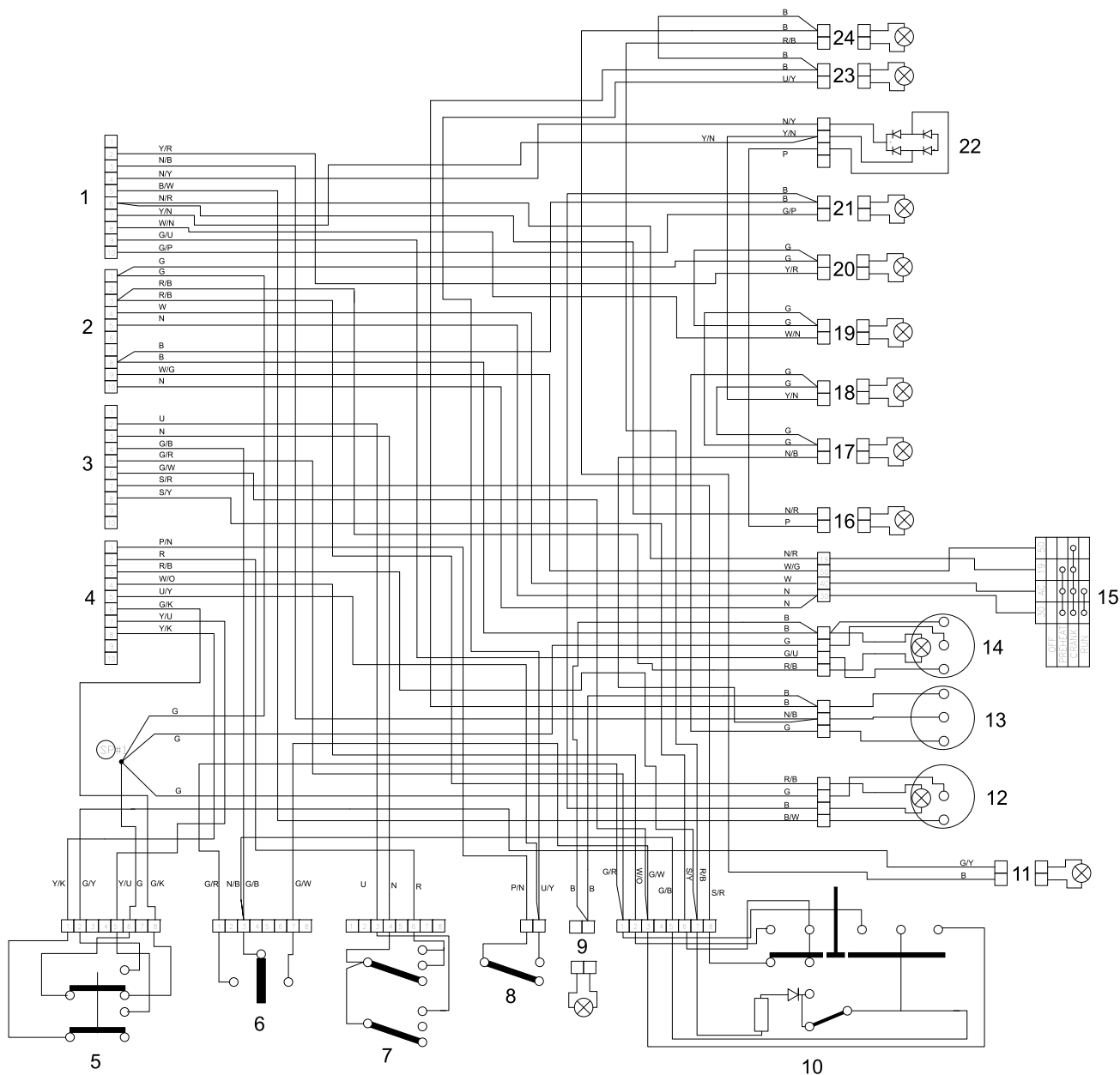
8.5 ELECTRICAL CIRCUIT GOVERNOR (LPG)



8.6 ELECTRICAL CIRCUIT ENGINE LPG-2



8.7 ELECTRICAL CIRCUIT INSTRUMENTS & CONTROLS



CABLE COLOUR CODE

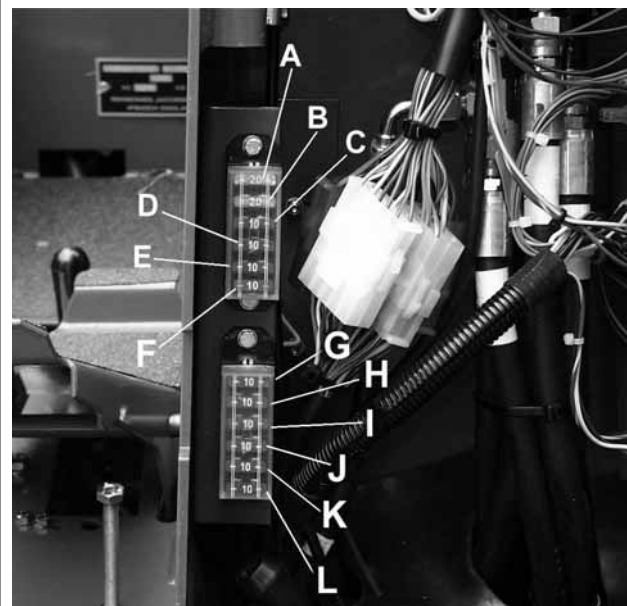
R Red
G Green
O Orange
S Grey
B Black
W White
K Pink
P Violet

Y Yellow
U Blue
N Brown
BG Black Green
BO Black Orange
NU Brown Blue
WG White Green
WY White Yellow

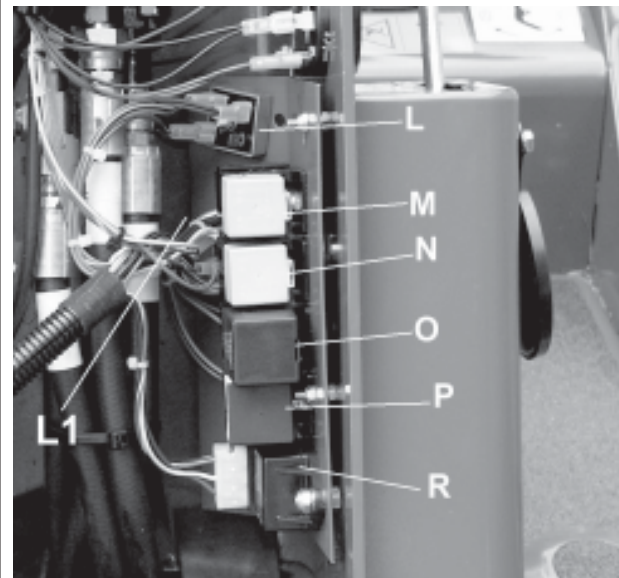
8.7 ELECTRICAL CIRCUIT INSTRUMENTS & CONTROLS

- 1 Connector B
- 2 Connector A
- 3 Connector C
- 4 Connector D
- 5 Mow Switch
- 6 Indicator Switch
- 7 Lamp Switch
- 8 Beacon Switch
- 9 Hazard Illumination
- 10 Hazard Switch
- 11 Mow Switch Illumination
- 12 Fuel Gauge
- 13 Hour Meter
- 14 Engine Temperature Gauge
- 15 Key Switch
- 16 Glow Plug Warning Lamp (Diesel only)
- 17 Alternator Warning Lamp
- 18 Blocked Filter Warning Lamp
- 19 Oil Pressure Warning Lamp
- 20 Engine Over Temperature Warning Lamp
- 21 Indicator Warning Lamp
- 22 Diode
- 23 Switch Illumination Lamp
- 24 Beacon Switch Illumination

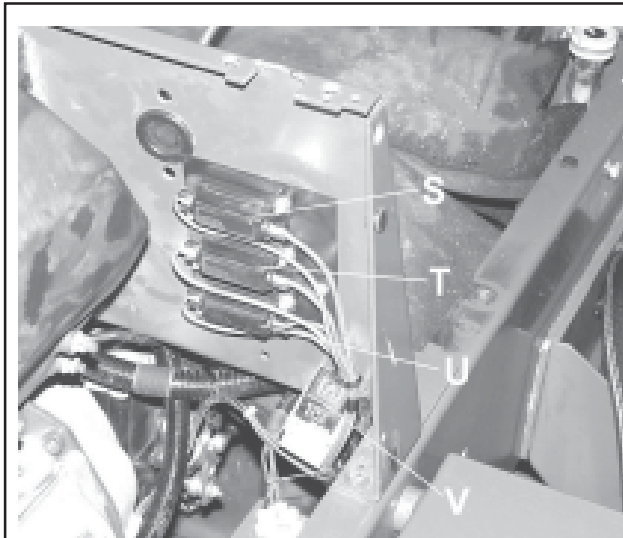
8.8 ELECTRICAL CIRCUIT FUSES AND RELAYS - DIESEL



- Fuse A – 20 Amp (Ignition) Wire colours Green & White.
- Fuse B – 20 Amp (Starter Soleniod) Wire colours White/Green & White/Orange
- Fuse C – 10 Amp (Cab Supply) Wire colours White & White/Purple
- Fuse D – 10 Amp (LH Side rear lights) Wire colours Red & Red/Black
- Fuse E – 10 Amp (RH Side rear lights) Wire colours Red & Red/Orange
- Fuse F – 10 Amp (LH Headlamp) Wire colours Blue/ Pink & Blue
- Fuse G – 10 Amp (RH Headlamp) Wire colours Blue/Red & Blue
- Fuse H – 10 Amp (Battery + to Hazards) Wire colours Brown & White/Orange
- Fuse I – 10 Amp (Ignition for Hazards/Indicators) Wire colours Grey/Red & White.
- Fuse J – 10 Amp (Beacon) Wire colours Purple/ Brown & Brown
- Fuse K – 10 Amp (Safety Circuit) Wire colours Green & White
- Fuse L – 10 Amp (Spare)



- Component L Diode Bridge (Main Harness)
- Component L1 Diode Bridge (Binnacle Harness)
- Component M – Relay 2 (Safety circuit: mow switch/parking brake)
Wire colours to holder White/ red, Black, White/yellow & Green/grey
- Component N – Relay 1 (Safety circuit: seat switch)
Wire colours to holder White/ orange, White/red, Green/ orange & Black
- Component O – Flasher Relay
Wire colours to holder Green/ Black, Black & Grey/yellow
- Component P – Seat Switch Delay
Wire colours to holder Green & Green/Blue
- Component R – Lamp Timer



FUSE S(TOP) – Brown wire to here will have an 'H' identification tag, this is the circuit for the Glow Plug Heaters (Pre'Heat)

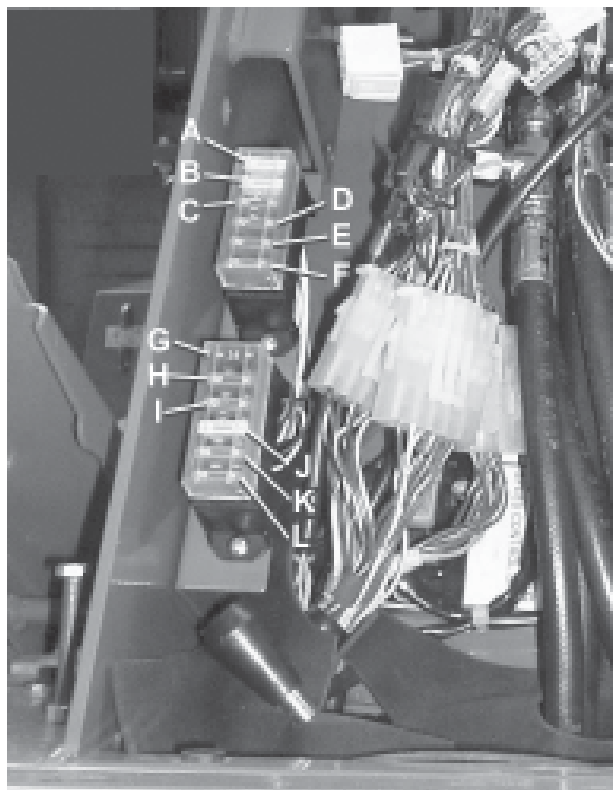
FUSE T (MIDDLE) – Brown wire to here will have an 'A' identification tag, this is the circuit for the Alternator.

FUSE U (BOTTOM) – Brown wire to here will have an 'S' identification tag, this is the circuit for the Safety system.

NOTE: ANY RED 'LIVE' WIRE FROM BATTERY CAN LOCATE ON TO ANY FUSE.

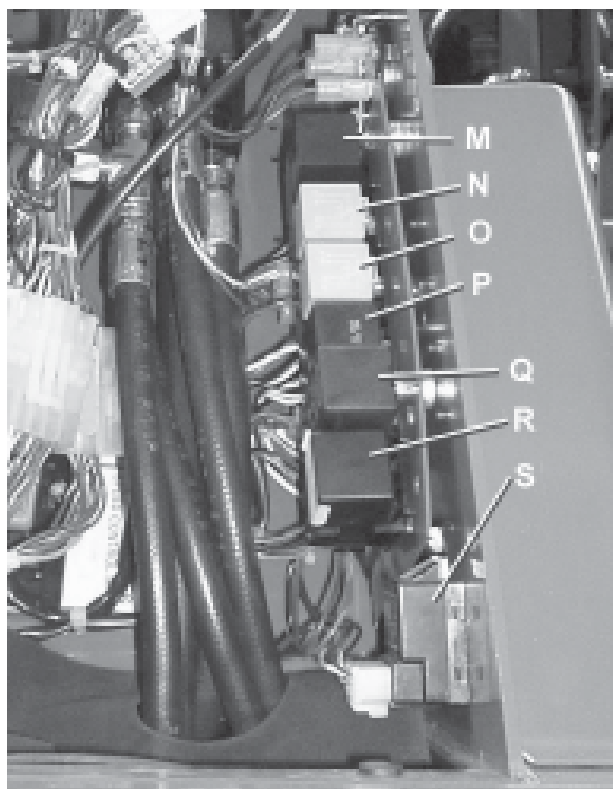
Relay V – 70 Amp (Heater Relay).

8.9 ELECTRICAL CIRCUIT FUSES AND RELAYS - LPG



Fuse A – 20 Amp (Ignition) Wire colours Green & White.
 Fuse B – 20 Amp (Starter Solenoid) Wire colours White/Green & White/Orange
 Fuse C – 10 Amp (Cab Supply) Wire colours White & White/Purple
 Fuse D – 10 Amp (LH Side rear lights) Wire colours Red & Red/Black
 Fuse E – 10 Amp (RH Side rear lights) Wire colours Red & Red/Orange
 Fuse F – 10 Amp (LH Headlamp) Wire colours Blue/ Pink & Blue

Fuse G – 10 Amp (RH Headlamp) Wire colours Blue/Red & Blue
 Fuse H – 10 Amp (Battery + to Hazards) Wire colours Brown & White/Orange
 Fuse I – 10 Amp (Ignition for Hazards/Indicators) Wire colours Grey/Red & White.
 Fuse J – 10 Amp (Beacon) Wire colours Purple/ Brown & Brown
 Fuse K – 10 Amp (Safety Circuit) Wire colours Green & White
 Fuse L – 15 Amp (Gas Relay)



Component M– Ignition Control Gas relay
 Wire colours to holder Yellow/ Black, Brown/Orange & Green/ Brown.
 Component N– Relay 2 (Safety circuit: mow switch/parking brake)
 Wire colours to holder White/ red, Black, White/yellow & Green/grey.
 Component O– Relay 1 (Safety circuit: seat switch)
 Wire colours to holder White/ orange, White/red, Green/ orange & Black.
 Component P– Flasher Relay
 Wire colours to holder Green/ Black, Black & Grey/yellow
 Component Q– Seat Switch Delay.
 Wire colours to holder Green & Green/Blue.
 Component R– Gas Relay - Engine Run.
 Component S– Lamp Timer - Diesel only.



FUSE T (Top) – Brown wire to here will have an 'A' identification tag, this is the circuit for the Alternator.

FUSE U (Middle) – Brown wire to here will have an 'S' identification tag, this is the circuit for the Safety system.

FUSE V Not Used

NOTE: ANY RED 'LIVE' WIRE FROM BATTERY CAN LOCATE ON TO ANY FUSE.

NOTES



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